FEDERATED STATES OF MICRONESIA

NATIONAL IMPLEMENTATION PLAN FOR THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS

2007

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1. Executive Summary

This document presents the FSM's National Implementation Plan concerning the various activities related to the Stockholm Convention on Persistent Organic Pollutants (POPs). The objective of the Stockholm Convention is to protect human health and the environment from POPs. The convention currently covers the following twelve chemicals: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, toxaphene, hexachlorobenzene (HCB), polychlorinated biphenyls (PCBs), dioxins, and furans. The Stockholm Convention calls for these chemicals 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.

These harmful chemicals share a combination of four properties which make them particularly deadly.

- They are highly toxic.
- They are persistent and can last for decades in the environment.
- They can evaporate and travel long distances through the air and water.
- They accumulate in fatty tissue.

Concentrations of these chemicals bio-accumulate, meaning that animals at, and near the top of the food chain have the highest levels of chemical contamination in their tissues. Chemical contamination can also be passed from mother to child during pregnancy and breastfeeding. For the fetus and the child, this exposure occurs at an extremely vulnerable time when body systems are in the delicate process of formulation. Establishing the link between an infant with birth defects and the mother's exposure to POPs may not be possible, as the exposure may have occurred years earlier, with the mother completely unaware of it.

The mobility and long-life of these chemicals means that people negatively affected have been exposed to chemicals which may have been produced in a factory 10,000 miles away. In addition to humans, populations of animals (some in danger of extinction) and the environment can be damaged or destroyed. For the FSM, the fragile nature of small island and reef ecologies is of great concern.

Two very dangerous chemical by-products, which are the most potent cancer causing substances known to man, have been identified. These are dioxins and furans. They have no chemical use, but are the unintentional by-products of combustion and other industrial processes. The citizens of the FSM have been exposed to these substances from three primary sources, 1) by the burning of trash at household and dump site locations, 2) from the smoke released from electric generation facilities and asphalt plants, and 3) from the engine exhaust of vehicles, outboard engines and even gasoline powered weed trimmers. Atoll residents who burn driftwood and persons who use plastic bags to help start fires are also exposed. Of the entire array of the dangerous chemicals, these two are the most worrisome to the residents of the FSM in that far more people are exposed to dioxins and furans than any of the other toxic substances.

Fortunately, relatively simple and straightforward interventions to reduce and eliminate these exposures are possible.

The FSM Congress signed the Stockholm Convention on 31 July 2001 and completed ratification of the treaty in February 2005. The FSM has signed and/or ratified a number of chemical management-related treaties in the last two decades. Activities supported by the Australia Agency for International Development (AusAID) to address the POPs in PICS (Pacific Island Countries) situation began in 1998 with a team of consultants visiting the FSM and other countries to complete an assessment of stockpiles of waste and obsolete chemicals and chemical contaminated sites. Beginning in 2002, local POPs-related efforts have been on-going and directed at improving the national situation by upgrading the capacity for the effective management of chemicals. One of the main components of this effort is the development of a national policy for chemical management. To this end, the National Implementation Plan (NIP) provides the framework for putting policy into action. This activity is supported by the United Nations Environmental Program (UNEP).

The FSM does not intentionally produce or use any POPs chemicals, and there are no future plans that would involve such POPs production or use. However, it is known that POPs have entered the nation as ingredients in pesticides, and PCBs in electrical transformers. The activities and issues associated with the importation, transportation, storage, use, and disposal of chemicals in the country have been accelerating since World War II because of the growing influx of commerce and industry. Stockpiles of obsolete (some no longer identifiable) potentially toxic chemicals have accumulated in each state since the early Trust Territory (TT) days. Presently, an effective and sustainable chemical management infrastructure is needed in order to be able to manage potentially dangerous chemicals at all stages of their life cycle.

In the FSM, the significance of the potential risk of health and/or environmental disasters that can be caused by chemicals, is not understood or appreciated by many people, including persons in leadership positions and the "average citizen on the street." Although news from the outside world is broadcast in many parts of the FSM, few people are aware that danger from chemicals is now present in the country. The reasons for this lack of awareness is that no major cases of known chemical poisonings in the country have occurred. No major environmental disasters have occurred. The discovery of oil leaking from a sunken WWII ship near an outer island of Yap has been the most newsworthy in-country environmental incident in decades. However, the leaking of oil from a ship, that has been sitting on the ocean floor for more than 50 years, was caused by strong currents associated with a storm. It was not an event that people see as something over which they have control, or should be overly concerned about.

Current stockpiles of obsolete POPs and other chemicals in the FSM have been addressed through an AusAID/SPREP project (POPs in PICs), and most of these have to be removed from the country for disposal in Australia. There are no proper systems in place for dealing with the safe storage of any other chemical stockpiles and hazardous wastes which might arise in the future, so the NIP includes a proposal to develop such a facility in each FSM state.

The POPs in PICS project also conducted a preliminary assessment of potentially contaminated sites in all four states. Measures are included in the NIP to deal with the clean up and remediation of these sites.

The current situation regarding all the POPs in the FSM is described in Chapter 3 of this document following a Country Profile.

The FSM's National Implementation Plan consists of seven specific action plans each targeting different goals and objectives. The action plans are as follows:

1. Legal Framework for Safe Management of POPs & Other Hazardous Substances
2. Hazardous Waste Storage, Disposal, and Contaminated Site Clean-Up
3. Phasing Out Existing PCBs and Disposal
4. Public Education and Awareness Concerning the FSM National POPs Situation and the Need to Reduce Dioxin and Furan Production
5. Pesticide Safety
6. Protection of the Marine Environment from Oil and Other Chemical Spills from Sunken and Grounded Vessels
7. Capacity Building

The action plans have been developed as a result of several national workshops and consultations with stakeholders. Much of the work is intended to be carried out by local personnel with assistance from international experts as necessary. This approach is intended to assist in developing local capacity for POPs management and implementation of the Convention. The activities are intended to be carried out over a period of four years, although some plans include on-going activities which will continue into the future. It is anticipated that the action steps to be undertaken in the NIP will eventually lead the FSM to a safer and healthier future for the nation's people and environment.

The NIP is divided into five sections. Following this executive summary the is a introduction that provides background on the Stockholm Conventions, details about POPs, and then explains the process of developing the FSM's NIP.

The third section includes general information about the FSM, provides a description of the local institutions, policies, and laws that are relevant to the nation's POPs situation, and last, gives an assessment of the POPs issues in the country.

Section four includes commentary on the implantation strategy employed in the Actions Plans, with a description of the "cross-project" budget considerations for the national and state level units which will have the responsibilities for project oversight (the national level) and activity implementation (the state level). The seven Action Plans follow. Each plan includes goals and objectives that are listed with a timeframe and estimates of the financial resources necessary to carry out the various activities of each plan. There are areas of plan overlap, which are indicated.

The final section of the NIP is comprised of six annexes with provide additional information on the twelve POPs chemicals, listings of individuals involved with the POPs project in the FSM, more detailed descriptions of the four FSM states, information on the removal of POPs during the POPs in PICS project, a comprehensive budget and time lime combining all seven Action Plans, and drafts of POPs public awareness messages that have been used in the FSM.

List of Acronyms

AG	Attorney General
AusAID	Australian Agency for International Development
COM-FSM	College of Micronesia – Federated States of Micronesia campuses
CSP	Conservation Society of Pohnpei
DEA	FSM Department of External Affairs
DFA	FSM Department of Finance and Administration
DMR	FSM Department of Marine Resources
DOJ	FSM Department of Justice
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
FSM	Federated States of Micronesia
GEF	Global Environment Facility
HESA	FSM Department of Health, Education and Social Affairs
KCSO	Kosrae Conservation & Safety Organization
MAPSD	Months After Project Start Date
MSDS	Material Safety Data Sheets
NCC	National Coordinating Committee
NHSAPWG	National Hazardous Substance Awareness Program Working Group
NHSEWG	National Hazardous Substance Expert Working Group
NG	National Government
NGOs	Non-Governmental Organizations
PCBs	Polychlorinated Biphenyls
PICs	Pacific Island Countries
POPs	Persistent Organic Pollutants
SAD	Self Assessed Declaration (Customs Import Declaration form)
SD	Sustainable Development
SDP	Strategic Development Plan
SOPAC	South Pacific Applied Geoscience Commission
SPC	Secretariat of the Pacific Community
SPREP	South Pacific Regional Environment Program
TC&I	FSM Department of Transportation, Communications & Infrastructure
TTPI	Trust Territory of the Pacific Islands
UNEP	United Nations Environment Program
WHO	World Health Organization

2. Introduction

2.1 Purpose of the National Implementation Plan

The purpose of this National Implementation Plan is to establish the various actions that will be undertaken in the Federated States of Micronesia (FSM) to successfully implement, among other activities, the specific activities required under Stockholm Convention on Persistent Organic Pollutants (POPs) The goal of the Convention is to protect human health and the environment from the harmful effects of POPs. The Convention recognizes the need for countries, in their implementation efforts, to integrate the conventions requirements with the overall goals of sustainable development and without negatively impacting on a nation's social or economic condition. It also endeavours to compliment the requirements and implementing tools of other related international conventions particularly the Basel Convention on the Trans-boundary Movement of Hazardous Substances and their Disposal and the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure, as well as other international and regional conventions relating to chemicals. The obligations of the FSM with respect to the Stockholm Convention are identified in Section 2.4 below.

2.2 Outline of the Stockholm Convention

The Stockholm Convention currently aims to eliminate or strictly control twelve select chemicals that are particularly dangerous and harmful to human health and the environment. These chemicals do not degrade easily and tend to build up in ecosystems and in human beings. Some of these chemicals are highly toxic, even in very, very small amounts.

The Convention explains a series of specific actions to promote the safe management of the POPs substances, regarding production, importation, exportation, application, and disposal. The management of the unintentional release of specific POPs chemicals, with the aim of significant reduction, is also addressed. The process of addition of other dangerous substances to the list is also described in the Convention document.

The FSM signed the Stockholm Convention on 31 July 2001 and the ratification of the treaty was completed on 15 July 2005. The FSM has signed and/or ratified a number of chemical management-related treaties in the last two decades, including, in particular, the Waigani Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Substances and to Control the Trans-boundary Movement and Management of Hazardous Substances within the South Pacific Region, and the Basel Convention referenced above. Activities supported by the Australia Agency for International Development (AusAID) to address the POPs in Pacific Island Countries (PICS) began in 1998 with a team of consultants visiting the FSM to complete an assessment of stockpiles of potentially hazardous substances, obsolete chemicals, and contaminated sites.

The Stockholm Convention is important to all countries and is sufficiently flexible to be applicable to small island countries as well as the large industrial nations. Since the FSM does

not commercially produce or export chemicals, the main POPs related issues are importation, transportation, storage, application, and disposal of these substances, and the creation of unintentional POPs by-products. The importation of everything, including chemicals, has been accelerating since World War II. While some stockpiles of obsolete (and in some cases no longer identifiable) potentially toxic chemicals have recently been removed from each FSM state, other unknown stockpiles may still exist. Presently, an effective and sustainable chemical management infrastructure is needed in order to be able to manage chemicals at all relevant stages of their life cycle. Most often, hazardous chemical problems have to be solved individually, and efforts must be focused on problems of priority concern. Priority determination should depend on severity and urgency.

2.3 Chemicals addressed by the Stockholm Convention

Presently the twelve POPs chemicals are: 1) aldrin, 2) chlordane, 3) DDT (dichlorodiphenyltrichlorethane), 4) dieldrin, 5) endrin, 6) heptachlor, 7) mirex, 8) toxaphene, 9) HCB [hexachlorobenzene], 10) PCBs [polychlorinated biphenyls], 11) dioxins, and 12) furans. Additional chemicals are currently being considered for addition to this list. The first eight POPs are pesticides, which were first developed to kill the insects and other pests which destroy crops, and to protect human life and livelihood from dangerous insect disease vectors. It is now known that these chemicals can also injure and/or kill humans. HCB is also a pesticide, and both HCB and PCBs are chemicals that were used in industry. PCBs are found in electrical equipment and in transformers manufactured in the United States, and other countries, from the 1950's to the 1980's. It was during the late 1970's that the dangers of PCB's were discovered and their use was then discontinued. Many transformers, with PCBs in them, have been in use on many Pacific islands, including some of the islands in the FSM. Dioxins and furans are by-products released from incomplete burning. Household, municipal, and agricultural burning and internal combustion engines (the gas and diesel run motors of cars, trucks, boats, lawn-mowers, etc) are some of the biggest producers of these dioxins and furans in the Pacific region. (See Awareness Message #6 in Annex 6 for more complete description of the twelve POPs substances.)

2.4 Obligations of the Stockholm Convention

A summary of the obligations of the Stockholm Convention relevant to the FSM include the following:

- To implement controls on the intentional production, use, import and export of the ten POPs used as pesticides or industrial chemicals (in compliance with Article 3)
- To take into account POPs, and chemicals that exhibit POPs characteristics, in regulatory and assessment schemes for chemicals (Article 3)
- To develop measures to reduce or eliminate POPs that are unintentionally produced (Article 5)
- To develop measures to identify and manage stockpiles and substances containing POPs (Article 6)

- To develop an implementation plan for meeting the obligations under the Convention (Article 7)
- To develop information exchange measures relating to POPs and their alternatives (Article 9)
- To promote public awareness and education about POPs (Article 10)
- To encourage or undertake research and monitoring efforts relating to the POPs situation(Article 11)
- To report on the progress of the implementation of the Convention (Article 15)

2.5 Development of the National Implementation Plan

2.5.1 Structure of the POPs Project

Beginning in 2002, the FSM's national and state level POPs-related efforts have been on-going and directed at improving the local situation by upgrading the capacity for the effective management of chemicals. One of the main components of this endeavour is the eventual development of a comprehensive national policy for chemical management. To this end, the National Implementation Plan (NIP) provides the framework for putting policy into action.

The FSM National Project Coordinator has been coordinating activities in consultation with a FSM National POPs Coordinating Committee and the four FSM States' POPs Task Forces. The actual implementation of project activities rests with these project teams located at the state level with the EPA offices being the focal point. The National POPs Coordinating Committee oversees the project activities.

The National POPs Coordinating Committee is composed of representatives of community and other stakeholders including members from various relevant national and state government departments and some Non-Government Organisations (NGOs). These various entities share the work of implementation of project activities. The members of the National POPs Coordinating Committee are listed in Annex 2.

In the FSM, the actual implementation activities, regardless of the sector, usually occur at the state level. Regarding POPs state level activities, each of the four FSM states have various entities responsible for environmentally related activities. Similar chemical control regulations exist in each of the FSM states, and the only major chemical management work being done by the states at this time focuses on pesticide control systems. Since state level staff are responsible for efforts protecting the local environment and also possess the most extensive and accurate knowledge of the situation of their particular islands, it is reasonable for most of the monitoring activities to be handled by the state governments.

2.5.2 Drafting of the National Implementation Plan

The first FSM national level workshop to address the POPs topic was held in Pohnpei in November 2002. The aim of that workshop was to begin the steps leading to the establishment

of a POPs National Implementation Plan_(NIP) for the nation. The implementation plan describes the strategy which the nation will follow to improve the POPs situation in the FSM. The NIP includes inventory information concerning materials and sites, a profile of the national infrastructure, control systems and their capacities, and action plans to address identified priority areas.

The National POPs Coordinating Committee was established in 2002 to provide oversight guidance for the FSM's POPs project. Subsequent national workshops have been conducted to organize inventory efforts, review the national profile, and set priorities and objectives. At a national level workshop in January 2005, the participants identified each of the following POPs issues to be addressed with an action plan.

- Development of a Legal Framework for the Safe Management of POPs and Other Hazardous Substances
- Hazardous Waste Storage, Disposal, and Contaminated Site Clean-Up
- Phasing Out Existing PCBs and Disposal
- Public Education and Awareness Concerning the FSM National POPs Situation and the Need to Reduce Dioxin and Furan Production
- Pesticide Safety
- Protection of the Marine Environment from Oil and Other Chemical Spills from Sunken and Grounded Vessels
- Capacity Building

The coordinated effort to execute, and then, as appropriate, put into 'everyday' practice, these seven action plans is the basic foundation and groundwork of the NIP. The action plans are meant to be adapted to each state's situation and unique implementation realities, while utilizing a national level body to provide coordination and an external interface. The final sections of the NIP provide a comprehensive budget and time frame for the entire implementation effort.

3. Country Baseline

3.1 Country Profile

3.1.1 Geography

The Federated States of Micronesia (FSM) is a developing nation comprised of 607 islands spread across more than one million square miles of the Western Pacific Ocean, just north of the equator. While the FSM covers a large area of the ocean (the east-west dimension is approximately 2,000 miles), the total land area is small, about 271 square miles. A total of more than 2,776 square miles of lagoon area exists among the islands. The country is divided into four states, Kosrae, Pohnpei, Chuuk, and Yap, with the national government offices located on Pohnpei. States are further politically (and in some areas culturally and linguistically) divided into municipalities and villages. Maps of the country and states are included in Annex 3.

Geologically, most of the inhabited islands of the FSM are volcanic in origin, and include both high islands and low atolls. The high islands have rainforest covered mountains rising to more than 2,500 feet, with steep slopes and deep valleys, both broad and narrow coastal plains, mangrove swamps, and are fringed by coral reefs. Most of the "outer" islands of the FSM are low coral atolls, some tiny and a considerable distance (three or more days on the field trip ship) from the state centers. The climate throughout the FSM is tropical with an average daytime temperature around 80 degrees (F), a relative humidity from 70 to 90 percent, and, depending on location, an annual rainfall of up to 200 inches or more. The high islands of Kosrae, Pohnpei, and those in Chuuk State receive an average of eight to twelve inches of rain per month during most of the year. Yap State has a bit less rain and more pronounced wet and dry seasons.

The nation's atolls have fresh-water lenses, which can be threatened by drought, pollution, and, in times of severe storms, salt water intrusion and contamination. Atoll populations must practice more serious water conservation than their neighbors on the high islands. The El Nino Southern Oscillation (ENSO) of 1998 caused drought conditions on all of the FSM islands and atolls. Lack of rain for several months caused all but the largest flowing streams on the high islands and most water sources on the atolls to dry up. Low lying areas on the high islands, and all of the nation's atolls, are susceptible to flooding during typhoons, tropical storms, and unusually high tides.

3.1.2 Population and Economy

The FSM's 2000 population and housing census indicates that 107,008 people inhabit 65 of the islands in the country. The census revealed that 52.7 percent of the total population is 19 years or younger, approximately 3.6 percent over 65, and the population is almost evenly split between male and female (102.6 males per 100 females). A large portion of each state's population is involved in subsistence agriculture and marine activities. For those who have entered the cash economy, the national and state governments continue to be the largest employers. The Compact of Free Association between the FSM and the United States has been the main financial support for the nation's economy, and the recently renegotiated extension of Compact funding continues this support, but with increased external controls over a slightly reduced level of funding. A

management group with members from the U.S. and the FSM (the Joint Economic Management Committee, or JEMCO), provides budgetary oversight. The financial assistance provided to the FSM is targeted for specific sectors such as health, the environment, and education.

The average population density for the nation is slightly less than 400 persons per square mile, with some islands very sparsely populated, and the "urban" state centers ranging up to nearly 5,000 people per square mile. In some areas the population lives in a relatively concentrated village setting with other areas (or islets) set aside for agricultural purposes. The number of inhabited islands occasionally changes as families on the small outer atolls may move from one islet to another. The average household size is 6.8, with a low of 5.5 in Yap and 6.3, 7.2, and 7.5 respectively in Pohnpei, Kosrae and Chuuk. The national average life expectancy is 66.7 years for males and 70.6 for females, and has improved dramatically since the end of WWII. In 2000, the crude birth rate (births per 1000 population during the preceding year) was about 28.1, however, in the last two decades the actual population growth rate has significantly slowed (3.0 percent in 1980-89, 1.9 percent in 1989-94 and 0.3 percent in 1994-2000), due to emigration to Guam, Hawaii, and the mainland US, not a decrease in births.

During the last three decades, a gradual, but accelerating, population shift towards the state centers has occurred. This migration is driven by the desire for access to services and a more "modern" life-style. For some families, with this move comes a daily struggle to obtain the basic necessities that were readily available back in the rural areas. A decrease in the quality of life, increased stress levels within the family, and a weakening of the extended family support system are the unfortunate results of this demographic trend.

The FSM is also a population in social transition. In less than two generations, people who were solely involved with subsistence level activities must now interact with a social and economic system that is overwhelming, confusing, and uninterpretable in many aspects. The extended family arrangement has eroded as young adult family members, who have entered the cash economy and become "bread winners," supplant the elders who traditionally held the positions of authority. Associated with the disintegration of the extended family is the breakdown of the effective kindred support system that it provided.

With regards to health status, the FSM's populations often suffer from the worst of two worlds. Throughout the country, many of the traditional tropical and developing world infectious diseases and under-nutrition problems continue to burden the population (particularly children). At the same time, many of the lifestyle diseases associated with more developed nations, problems of over-nutrition, inactivity, injury, and substance abuse, are placing a heavy toll on the health of many citizens. Each state's health services infrastructure has a hospital, a public/primary health care division which includes various prevention and health promotion programs, and a dispensary network. Due to the wide dispersion of islands and villages, some very geographically isolated with very small populations, the logistics of providing comprehensive and quality health care services to all of the FSM's residents are challenging. Shortages of staff and medical supplies are common.

The leading causes of death among infants and young children are respiratory infections, pre-maturity, and under-nutrition. With the addition of diarrheal diseases, these health problems are

also the leading causes of child morbidity as measured by outpatient visits and hospitalizations. Among older children, teenagers and young adults, injuries become the predominant cause of death, as they are in most parts of the world. Among unintentional injuries, numbers of water-associated deaths are about equal to motor vehicle-related deaths. Among intentional (violent) injuries, the high suicide rate is particularly notable, and is thought to be due to the burden of cultural and economic dislocation, particularly for young adult males. Suicide rates for young adult males in Micronesia are among the highest in the world. Alcohol is often a contributing factor in violent incidents.

In the FSM cancer has been, for the most part, an unrecognized disease burden on the citizens, the health providers, and the governments. Cancer is the leading cause of death in Yap, the third leading cause in Pohnpei, and Chuuk, and fifth in Kosrae. For women in the country, cervical, breast, uterine, and lung cancers cause over 50% of the mortality due to cancer. For men, lung, liver, and prostate cancers account for nearly half of the cancer deaths.

Among adults, heart disease and stroke have become the leading causes of death. The very high rates for adults aged 25 to 55, is two to four times the U.S. rate for similar age groups. This high rate of premature cardiovascular mortality suggests that the combination of lifestyle (high fat/sodium/calorie diet, lack of exercise, and tobacco and alcohol use) and genetics have created an unusual burden on the FSM population that otherwise would only show patterns of disease similar to other developing countries in the world. Diabetes is a major underlying contributor to morbidity and mortality. Indeed, the fact that these high rates of non-communicable diseases exist in the FSM in the face of the continued high incidence of tuberculosis, Hansen's disease, rheumatic fever, rheumatic heart disease, etc., indicates that the FSM, in a situation similar to other Pacific island countries, has not completed an epidemiological transition, but rather, is in the unenviable position of being doubly afflicted by disease patterns of both a developing and a developed country.

Each state center island has a partially paved road system, with each state at different stages of paving other roads. Pohnpei's roughly 55-mile circumferential road was completely paved in 2005. The 2000 census reported that nationally, 34.6 percent of households owned at least one vehicle and about one quarter of that number owned more than one. This computes to about 10,000 vehicles in the country if government owned cars and trucks are included. About half of all the FSM's vehicles are located on Pohnpei, while Kosrae has about ten percent. The balance is about evenly split between Chuuk and Yap.

The FSM's economy is based largely on funding received from the US Government under the terms of the Compact of Free Association. Many FSM citizens living abroad send funds to the family "back home" in the islands. Although no accurate accounting of the overall financial value of this practice is available, it is estimated that as much as $15 million annually arrives via this informal system. Other revenue is generated from exports consisting primarily of agricultural and fish/marine products. The selling of fishing rights to foreign countries, and income from the tourism and handicraft industries are making an increasing contribution to the economy. However, these industries can be subjected to significant variations, which are beyond local control.

The 2004 World Almanac reports an estimated 2002 national gross domestic product (GDP) of US$277 million for the FSM, with imports of $149 million, and exports of $22 million. The individual median income (2000 estimate) of $1,489 varies significantly from island to island, and has decreased in recent years since many people who did not previously have a cash income, had small incomes in 2000. Household median income was $4,633 in 2000, and about 90 percent of all the FSM's households had a member with a cash income. Considerable variability exists between individual islands and communities, as large portions of outer island populations are involved only with subsistence livelihoods. The government is a major employer, while agriculture and fisheries, tourism, handicrafts, construction, retail/wholesale, and services provide the bulk of the private sector employment.

Industry in the FSM is limited to those operations which can be financially viable in spite of the nation's geographical isolation and distance from suppliers of raw materials. Most production processes in the country are home-based "cottage industry" operations creating carved or woven handicraft items. Larger industrial activities in each state are related to either the maritime/fisheries sector, construction, or power generation. The copra industry is of significantly less importance than in past years. It now constitutes a minor portion of the country's exports. Coconut oil products (soap, shampoo, body and cooking oils, and bio-fuel) for local sale and export are manufactured by two small facilities located on Pohnpei. Small scale furniture production shops operate in Kosrae and Pohnpei to supply local demand. In Yap, a small operation processes coral into lime for commercial sale to betel nut chewers. Each state has various sizes of construction companies making roads and/or erecting buildings. Asphalt plants provide paving material in Kosrae and Pohnpei. A number of cement batch plants and concrete block productions facilities exist in the nation, with most states having two or more.

Other small industries include printing shops, photo-processing shops, and sign/banner shops which also print shirts. Several private medical clinics are now operating in Pohnpei and Chuuk.

All four FSM states have one power generating facility in the state center, while both Chuuk and Yap also have plants on their outer islands with the larger populations. The hospitals, telecommunications offices, government offices, banks, and numerous larger commercial enterprises have various sizes of generators for use or to provide back-up power. These run from thousands of small portable units, to an estimated 400 midrange size (50–200 KVA), to approximately 20 larger stationary 400-600 KVA units in the country.

Each FSM state is involved to varying degrees in the fishing industry. Fish is caught by both foreign fishing vessels licensed to fish in the FSM's vast ocean area and by local fishermen. No canning operations exist in the country, however, some fish processing is done in-country (mostly cutting loins, etc). Most of the commercial catch is exported to Japan.

In 2006, the FSM's transportation related industry included one regional airline headquartered outside of the country and two local air services. Each state has one airport in the state center capable of accommodating "737-size" jets, and smaller landing strips on a few of the larger outer islands/atolls. With regard to land transportation businesses, private fleets and some individuals' cars and trucks provide taxi services in the state centers. In Chuuk, small boats provide ferry services within the main lagoon, primarily to and from Weno.

Petroleum products storage and distribution facilities are located in each of the state centers, while numerous gas stations (with electric pumps) are also located on the main islands. Fuel dispensing in the more distant locales is often by hand pump or siphon. Two major suppliers of petroleum products operate in the FSM. Each of the islands has a distributor of LP gas.

Numerous vehicle and small engine repair shops operate in each state as well as general home repair and air conditioning services. Each state has at least one printing service in the private sector, plus some printing is done by the state Departments of Education. None of these operation employs more than 15 people.

At the present time, no mining operations exist in the nation. Extraction activities, limited to quarrying for rock and other fill materials (primarily dirt), are done in each state. Some of the quarrying operations are private, while some are run by the state governments. Dredging for coral as a road base and fill is also done in each state. During the Japanese period, phosphate was mined on the outer island of Fais, in Yap state.

The vast majority of the FSM's population that is involved in agriculture does so mainly for subsistence demands, with the exception of black pepper export and the locally sold cash crops of sakau (kava) on Pohnpei, and betel-nut in each state. When there is a need for cash, farmers will harvest whichever of their crops is in season at the time and sell them at the local markets. Citrus grown on Kosrae, bananas and sakau grown on Pohnpei, and betel-nut from Yap are the major agricultural exports. A small number of local markets buy from the farmers, pack, and then ship to off-island buyers, mostly in Guam. There are no commercial farms in operation that employ more than 15 people. Methods employed by most farmers do not always involve the clearing of tracts of land, and thus measurement of farm size is not possible. Breadfruit, bananas, taro, yams, tapioca, potatoes, and coconuts are among the crops grown and consumed as dietary staples.

Specialized support for increasing and expanding local agriculture production (and the anticipated subsequent reduction of the consumption of imported foodstuffs) is provided by each state's Agricultural Division, with technical assistance provided by several international projects and local non-governmental organizations. The expected results of these programs are improved nutrition and improved general health of the population.

Subsistence fishing follows the same pattern as agriculture. Fishermen usually use their catch to feed the family, but when cash is needed, the fish are sold at the market. Due to a increased desire for imported foodstuffs and other items, often more fish have been sold instead of consumed by the family. Other marine environment exports include black pearls, coral and tropical fish for aquariums, and natural sponges.

Industrial entities are few in number within the FSM and are limited to light industry, small shops (auto repair, cement block, printing, fiberglass, coconut processing), construction, and power generation. The fish processing industry is also active in the country, but primarily is focused on trans-shipment of fish to destinations in Asia. No canning of the product is performed. The dry-docking facility in Kosrae is involved primarily with vessel repair work.

No local industries produce or formulate chemicals in the FSM, with the exception of the LP gas businesses which produce oxygen. They also import and store nitrogen, argon, helium, carbon dioxide, and acetylene for distribution to local users. Information on the safe handling and use of these substances is available from the businesses, and they oversee the condition of the various canisters and other containers used. The nation's importers and retailers are responsible for the import of general use chemicals, such as solvents, paint additives, etc., and most can provide MSDS's as required. Overall, the relevant activities of the FSM's industrial sector are generally not geared towards chemical management beyond what is necessary to safely conduct its various operations.

The petroleum industry is the primary importer of petroleum products which are distributed and then sold on a wholesale and retail basis. The industry also handles the bulk storage of petroleum products at facilities in each of the four states. These businesses are international in scope and have existing procedures established for all aspects of the management of their chemical products. Training on safety and emergency procedures for the employees of these companies is provided on a regular basis.

The transportation sector is one of the major users and handlers of petroleum products. Each state's airport and seaport has storage and dispensing facilities for use by airplanes and ships. The airlines which serve the FSM are international or regional carriers and also have established international guidelines which are followed. Employees of these businesses also receive safety and emergency procedures training. The local shipping services are operated by the national and state governments and have been providing services to the outer islands of the country for several decades. The expertise to safely manage the chemicals typically used on board the ships exists within the staff responsible for the day-to-day operations.

3.1.3 Political Profile

The capital of the FSM is located at Palikir on the western side of Pohnpei island. The national government is composed of three branches, with a unicameral legislature from which the president and vice-president are selected. The state governments have a similar set up, except for Chuuk which has a bicameral legislature. At the state level, governors and lieutenant governors are popularly elected. Each state is further divided into municipalities, most with the three branch government systems. In rare cases a very small municipal or village population (several hundred persons) is governed by these three levels, resulting in the unusual situation where government employees outnumber the citizens that they serve. In general, national government offices are responsible for: 1) interfacing with external entities such as foreign countries and international agencies, 2) professional licensure and standards in the education and health sectors, 3) immigration matters, and 4) the coordination of national plans and policies. State governments deal with the actual implementation and provision of public services, such as schools, health facilities, utilities, and public safety.

Coordinating environmental protection efforts, the FSM Department of Health, Education and Social Affairs includes an Environmental Health Unit. This unit serves as a liaison with external organizations and programs dealing with environmental quality issues, and provides

programmatic assistance to the states. In its executive branch, each state maintains an Environmental Protection Agency, or an office which may carry a different name, but which provides similar functions.

The states are comprised of a main "state center" island and outer islands, except for Kosrae, State, which is composed of only a single island. The state government offices are all situated on the largest island in the state, which is also the center of commerce, post-primary education, transportation (airport and dock facilities), and the location of the state hospital. No area in the FSM can be considered truly "urban" in the sense of a big city environment, but the state centers often have a town setting with streets laid out in blocks. No building in the country is more than five stories tall. Health Service dispensaries and primary schools are located in most of the municipalities and on the more heavily populated outer islands.

3.1.4 Culture

The people of the FSM are a diverse group culturally as well as linguistically. In each of the four island states, during the centuries prior to outside contact, relatively isolated societies developed. Cultural practices vary between, and sometimes even within, each of the states. Rites of passage for men and women; traditional hierarchy systems; food preparation; activities surrounding births, marriages and funerals; child-rearing practices; traditional gender roles; patterns of resource use and conservation, and methods of mediating or arbitrating disputes in the community vary from area to area. Atoll-based societies differ from those on the larger high islands, and two of the three southern outer atolls of Pohnpei State have populations not of Micronesians, but of Polynesians, with yet another distinct language, and a different set of values and customs.

Seven major languages are spoken in the country, and English is spoken by most of the government leaders and is the official language used in national government activities and documents. Various orthographies have been developed for the major local languages. The census indicates that approximately 92 percent of the population (10+ years) is literate in at least one language, and that 83 percent of the population use English as their second language. Some older adults cannot read or write English although they may read, write, and speak Japanese, as learned in the decades leading up to the Second World War. However, for the transfer of information, and discussions concerning personal matters, the most effective means of communication for the vast majority of the FSM's population remains the individual's first language. Environmental protection messages, health promotion communications, and other educational materials must be translated into the local languages to achieve the most effective, wide-spread delivery and comprehension.

At the present time, the awareness among the general public of the dangers presented by POPs and other hazardous chemicals is very low. Economic development, urbanization, and increased industry also brings additional opportunity for unintentional and intentional exposure to chemicals. Warning labels on potentially dangerous substances are many times not read or understood by the user. The consumer may not be able to understand the label language, or may not be aware that a danger even exists. In some instances fertilizers are distributed without any written or orally provided instructions for use. The burning of yard waste, which may include

plastics, rubber, and many other inorganic items, is a common practice. Establishing the link between exposure and illness becomes nearly impossible under these circumstances. In addition, some Micronesians still believe that diseases are brought upon a person by gods and/or ancestors for various reasons (such as punishment for certain members of the family or clan who have offended the gods or ancestors). Because of such beliefs, efforts to alter long established behaviors sometimes meet with strong resistance.

3.1.5 Environmental Overview

The FSM consists a mix of high islands and low-lying flat coral atolls. The low elevations above mean sea level make the atolls very susceptible to climate change and sea level rise. Some of these islands are elongated and so narrow that it is possible to see both the ocean and lagoon sides of the island from the middle of the island. The atolls are fairly uniform in composition, mainly sand of coral origin, resting on a reef platform. Fresh water is obtained by capturing rainwater or tapping the fresh groundwater lens.

The FSM's high islands are also vulnerable environments. Landslides occur on steep slopes, and some streams often flood in heavy rainfalls. Loss of natural vegetation in the watershed areas of some high islands is of concern, as is the resultant erosion and silt deposition in the mangrove swamp and on the reefs.

Threats to the country's environment include climate change, population pressure, over fishing, destruction of reefs, sand and gravel mining, clearance of natural vegetation, fresh water pollution, improperly handled solid waste, hazardous waste, and invasive species.

3.2 Institutions, Policies, and Laws

3.2.1 Relevant Policies and General Legislative Framework

As has been mentioned, actual implementation activities in the FSM, usually occur at the state level, while country-wide oversight, inter-state coordination, and external linkages are handled at the FSM National level. Concerning the control of POPs and other hazardous substances, limited information exists since, to date, this matter has not been one of the higher priority topics of discussion in the nation. At the FSM's first Environmental Summit (October 2006), however, the increasing importance of protecting the nation's varied ecosystems was noted, and substantial commitment by both the government and non-government organizations (local, regional, and international) was pledged. Thus the FSM's environmental policies are in line with those of the several conventions and agreements by which the country has agreed to abide, including: protecting ecosystems, adapting to and mitigating climate change, and working against terrestrial, freshwater, and marine degradation. The participants of the Environmental Summit noted that a policy of rapid economic growth in the small island nation, must involve a careful and comprehensive examination of the 'sustainability' of the development.

The present legislative framework pertaining to the management and control of chemicals (focusing mainly on pesticides) has been in place since the Trust Territory period, and has not

been sufficiently updated or been given resource support to the point where one could say that no gaps exist. While the hazardous, obsolete chemicals that are in the FSM today have been identified and are in the process of being removed, it is the lack of need or demand for such chemicals that has led to the present legislative situation. Basically, very few attempts to import highly hazardous substances are made because there is very little need. The FSM has no large commercial farms, only very light industry, small power generation facilities, and no significant mining operations.

State regulations provide for the control of pesticides, and provide a detailed list of the information that must be included in the registration process. These regulations address the major topics on chemical management and control, including labelling requirements, the registration procedures, and the qualifications/standards of competency necessary for individuals to be classified as "commercial applicators." The laws and regulations in each state are similar, with the EPA being the responsible authority. The laws are made known publicly via a public education processes. Each state has radio stations which disperse information about laws and regulations. The Public Information Offices at the national and state levels are also tasked with getting important information disseminated throughout the country, and often this entails utilizing the local print, radio, and video media available in each state. All State EPA offices print and distribute free newsletters containing information relevant to environmental protection issues.

3.2.2 Roles and Responsibilities of Government Agencies

As with many social issues, the management of chemicals in the FSM requires the involvement of a number of government departments at the national and state levels. In some instances, such as with the state agricultural offices, the chemicals are managed by their staff for the simple reason that the chemicals are used in the programs which they operate.

The major chemical management work being done by the states at this time focuses on pesticide control. "Notification of Import" forms that collect information concerning the import and use of pesticides have been developed by each state.

At the FSM National level, the Environmental Health Unit is operated under the Department of HESA, while at the state level the entities responsible for environmental protection are located in EPA (or equivalent) offices under the executive branch. as semi-autonomous government agencies overseen by boards of directors. While legislation exists regarding pesticides, these entities have a mission that includes protection of the environment. Thus, their sphere of interest includes all stages of the chemical life-cycle, except production. Other offices at the national level which play a role in environment-related activities, include the Departments of Economic Affairs, Foreign Affairs, and Justice. Other offices at the state level include Agriculture, Public Safety, Health Services, Land and Natural Resources, and Economic Development. Each state's executive branch has departments with similar functions.

The FSM Department of HESA and the four state Departments of Health Services focus on health promotion, disease prevention, and primary/secondary medical care. The national level health services office is primarily responsible for coordination with external financial

arrangements, licensure, and standards of care. The state hospitals and clinics are where the provision of health services actually occurs. Chemicals are utilized in the diagnosis and in the treatment processes, to restore the health of the patient. The medical support staff, including medical supply technicians, radiologists, and laboratory staff have received training concerning the various uses of chemicals that they handle.

Chemicals may also be the cause of disease or injury and when a physician determines that exposure to a chemical substance has had a negative health impact on a patient, the doctor must determine if notification of the state EPA or Agriculture Office is in order. The exposure may have occurred as a result of improper storage, transport, distribution, handling, or disposal. The physician's decision must be made based on whether or not the exposure is a threat to the public health. The State Departments of Health are also responsible for the emergency medical response should a major incident involving exposure to toxic substances occur.

In the FSM, the agriculture departments serve to improve the production of locally grown food stuffs. This goal has dual benefits of providing additional nutrition to the diets of residents of the FSM and also reducing the need to import sometimes expensive and typically less nutritious foods from external sources. Agricultural agents assist farmers to improve crop yields and in some cases, may recommend the use of pesticides. These experts are thus involved in all aspects of the life cycle of agricultural chemicals except their production. Each state agriculture office employs fewer than ten persons.

The Secretariat of the Pacific Community (SPC) maintains an Office on Pohnpei in which, at present, three SPC programmes are operating: sustainable agriculture, forestry and plant protection, with a contingency planning project for dealing with avian influenza among farm animals in the near future. The Plant Protection program assists the FSM government with customs efforts to identify and confiscate potential agricultural threats at the airports and seaports of the country. This office also assists local efforts to identify and eradicate invasive species. The office maintains a laboratory, and provides training and oversight for activities which involve the use of chemicals in the eradication process.

One of the FSM Trade and Commerce Office's responsibilities is to facilitate the development of overseas markets for FSM products. Since many of these products are in the agricultural sector, the office is concerned that any chemical used by the farmer, is used correctly so that no compromise is made affecting the quality of the exported product. The Economic Development Offices at the state level have similar interests.

The FSM Department of Finance, through its Division of Tax and Revenue, has the responsibility of collecting import tax on all items imported into the nation. The Division's duties also extend to the classification of all imported goods. The Customs Tariff Code System (Self Assessment Declaration, SAD) has just recently been introduced into the import paperwork. In future years it will be an effective tool in calculating the amount and value of chemicals imported into the FSM. Customs inspection/flagging of imports is an essential component of the control of chemical imports into the country.

The FSM national and the state level Departments of Justice have a responsibility to enforce the laws and regulations relevant to all aspects of the chemical life-cycle. They also serve to assist in the interpretation and clarification of the various laws regulating the management of chemicals. Both national and state legislative bodies responsibility to create relevant laws dealing with all aspects of chemical use in the country.

The FSM Department of Foreign Affairs has an indirect role with regard to the importation of chemicals from certain countries, particularly those nations not fully aware or otherwise unable to provide all of the necessary information about the substances that they are exporting to the FSM. The requirement that warnings and directions for use must be in English may pose a problem. The Department of Foreign Affairs can facilitate the proper exchange of information which would remove this obstacle to trade between the two nations.

Limited resources for chemical management activities impact on the capacity to successfully perform roles and responsibilities. As the FSM's demand for more chemical products increases, it will be necessary to provide additional financial and logistical support for all offices involved in the management of chemicals. It will also be necessary to provide a higher level of training for the numerous personnel engaged in chemical management. Training for Customs personnel who would inspect imports for dangerous chemicals is essential.

3.2.3 Relevant International Commitments and Obligations

The FSM participates in a number of international and regional organizations, some of which have strong direct relevance to chemical management and others having a more indirect connection. Membership in international organizations has been sought for several reasons, including international recognition and contribution considerations. Such contributions may involve financial support or contributions of other resources such as services or equipment. Membership in some organizations requires that an annual fee be paid. However, in most cases the benefits realized by the country from the membership far outweigh the fee expense.

The FSM's membership in international and regional organizations and points of contact in the FSM government are listed below.

• Intergovernmental Forum on Chemical Safety	HESA
• United Nations Environment Program (UNEP)	Foreign Affairs/HESA
• World Health Organization (WHO)	HESA/Foreign Affairs
• Food & Agriculture Organization - United Nations (FAO)	Foreign Affairs/DEA
• United Nations Development Program (UNDP)	Economic Affairs/DEA
• Asian Development Bank	Finance
• Pacific Islands Development Program/East-West Center	Foreign Affairs
• Secretariat of the South Pacific (SPC)	Foreign Affairs
• South Pacific Forum	Finance
• Global Environment Facility (GEF)	HESA
• International Labour Organisation (ILO)	Economic Affairs
• United Nations Framework Convention on Climate Change	Economic Affairs
• South Pacific Applied Geo-science Commission (SOPAC)	Economic Affairs

- South Pacific Regional Environment Program — HESA
- South Pacific Bureau of Economic Cooperation — Foreign Affair

As with the organizational memberships, a similar situation exists with regard to the FSM's involvement in a number of the international and regional agreements, conventions, and treaties. Some of the agreements, to which the FSM is a party, directly address chemical safety and management, while others have a focus more on the protection of natural resources and the environment. The country's status with respect to the agreements varies, some have been signed, some "entered into force," some ratified, and for some accession status has been achieved.

The FSM is a party to the following international agreements relating to chemical management and waste:

- Convention on the Prevention of Marine Pollution by Dumping of Substances and Other Matter (London, 1972)
- Convention for the Protection of the Ozone Layer (Vienna, 1985) and its Montreal Protocol
- Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (Chemical Weapons Convention, CWC)
- Convention on the Control of Trans-boundary Movements of Hazardous Substances and their Disposal (Basel, 1989)
- Convention to ban the Importation into Forum Island Countries of Hazardous Substances and Radioactive Substances and to control the Trans-boundary Movement and Management of Hazardous Substances within the South Pacific (Waigani, 1995)
- Single Convention on Narcotic Drugs (1961)
- Convention on Psychotropic Substances (1971)
- United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988)
- ILO Convention No 170, Convention Concerning Safety in the use of Chemicals at Work (1990)
- FAO International Code of Conduct on the Distribution and Use of Pesticides 2002 revised edition; and
- The Globally Harmonized System of Classification and Labelling of Chemicals (GHS).
- Agenda 21 - Commission for Sustainable Development
- Stockholm Convention on POPs (2001)
- UNEP London Guidelines(voluntary procedure)
- GATT/WTO Agreements
- Agreement on Regional Cooperation in Matters Affecting International Shipping in Micronesia
- Convention for the Protection of the Natural Resources and Environment of the South Pacific Region
- Nuclear & Chemical Weapons Conventions, including the Comprehensive Nuclear Test Ban Treaty
- Biodiversity Convention

3.2.4 Existing Legislation and Regulations Addressing POPs

There are few existing FSM national or state legislation or regulations specifically addressing POPs substances. However, almost all of the POPs substances are included under one or more of the various state and national regulations that address the following topics: control of banned and/or restricted insecticides; pesticide control; water pollution control; oil spill reporting; and the requirement to prepare Environmental Impact Statements (EIS) The legal instruments in the FSM that pertain specifically to chemical management almost entirely target the toxic substances that are found in pesticides and insecticides. There are legal mechanisms to control various aspects of importation, sale, storage, application, handling, use, distribution, disposal, and removal of chemicals used in pesticides and insecticides. Most of these instruments are regulations "inherited" from the Trust Territory administration.

The follow list includes FSM national and sample state regulations.

- Section 2. of Article XIII of the FSM Constitution states that, "Radioactive, toxic chemical, or other harmful substances may not be tested, stored, used, or disposed of within the jurisdiction of the Federated States of Micronesia without the express approval of the national government of the Federated States of Micronesia."
- Regulation – FSM Code (from TT Code Title 41, Parts 165 to 169, [1974]) – Insecticide Control, includes listing of Restricted and Banned Chemicals
- Regulations – FSM Code (from TT EPA Board Regulations Title 25, [1974]) – Water Pollution Control
- Regulations – FSM Code (from TT EPA Board Regulations Title 63, Chapter 13, Subchapter IV, [1980]) – Pesticide Control, includes listing of Restricted and Banned Chemicals
- Sample - Regulations from Yap State Environmental Quality Protection Act - Yap State Code Section 1507(a), (1994) – Requirements for oil spill reporting (Similar regulation is in effect in each of the FSM States.)
- Sample - Regulations from Yap State Environmental Quality Protection Act - Yap State Code Section 1509(a), (1995) – Requires Environmental Impact Statements (Similar regulation is in effect in each of the FSM States.)
- Sample - Regulations from Yap State Pesticide Regulations - Yap State EPA Regulation No. 2001-1, (2001) – control of pesticides, importation through to disposal (Similar regulation is in effect in each of the FSM States.)
- Application for Pohnpei State Environmental Protection Agency POPs Permit (Pesticide Notification of Import form)

3.2.5 Key Approaches and Procedures for POPs Chemical and Pesticide Management

The FSM government structure is not huge, although it is scattered geographically. Cabinet meetings, other inter-departmental meetings, workshops and conferences all serve to keep coordination problems to a minimum. Good electronic communications also help improve coordination. A general awareness exists in the minds of many FSM citizens and their leaders that sustainable development is an attitude, not just a catch phrase. However, as more and more different aid-related activities become available and are implemented, it becomes necessary to

expand and institutionalize procedures like the environmental impact assessments to cover a broader scope. Thus the protection of health, personal safety, and a sound environment will be ensured.

The effectiveness of international assistance programs in the FSM can be substantially improved by a better understanding of the local conditions and the challenges these conditions pose. Effective communication systems must be established so that all stakeholders have a good understanding of short and long-term goals and of expectations. The roles of all parties and the deliverables should be clear. An important issue is expediting the smooth flow of funds and anticipating logistical snags. Chances for successful outcomes are enhanced if the implementers of a program encourage local participation from as early on in the project as possible and provide the essential expatriate expertise in a culturally acceptable manner.

Typical obstacles to the effective implementation of international agreements are inadequate financial support, poor communication, poorly planned transport and logistics, and inadequate personal commitment of the personnel engaged in the programs. Though these are the most common obstacles experienced, others may arise depending on the type and nature of the program introduced. These obstacles can be overcome by knowing the situation in-country and appointing a local project manager (or assistant manager) who understands this situation. Budgets must provide adequate financial support to accommodate salaries, transport, equipment, and other expenses for the duration of the project. It is essential to employ personnel with good communication skills and develop effective communication systems.

3.3 Assessment of the POPs Issue in the Country

The Phase I scope of work of the POPs in PICs involved an assessment of the stockpiles of waste and obsolete chemicals, and the identification of contaminated sites in 13 Pacific island countries, including the FSM. The surveys in the four FSM states took place between April and July 1998, with State EPA (or equivalent) Office staff assisting the consultant. All of the local staff gained valuable experience in identifying the waste chemicals, learning where the existing stockpiles are located, and understanding the challenges to safely address the problems of removal and disposal.

The Phase II scope of work of the POPs in PICs involved the disposal of contaminated solvent and soil, stockpiled chemicals known to contain POPs, and unidentified chemicals which are considered hazardous The clean-up teams that visited the FSM worked with the state EPA personnel and the local staff had the opportunity learn the correct procedures and techniques for handling toxic materials. During the past two years, SPREP and the US EPA has organized the removal of significant amounts of POPs and other hazardous substances from the FSM's islands. Annex 4 provides information on the items removed.

3.3.1 POPs pesticides

Almost all of the pesticides and insecticides sold in the retail outlets in the country are imported from the US and have clearly visible warning labels and instructions in English. Some store

clerks have the capacity to translate into the local languages as necessary, but may not be able to provide adequate technical advice. However, as more and more imported items arrive from Asian countries, concern is justified that the labelling and warning messages will not be readable. All labelling and associated warning labels must be printed in a language that is understandable to the consumer, or at the very minimum an additional step should be included in the distribution process which provides written instructions in English or the FSM language used at the point of distribution. However, effective enforcement may be problematic as this regulation became effective 24 years ago, and needs both updating and the establishment of enforcement mechanisms at the state level.

3.3.2 PCBs

During the removal activities described above, a majority of the known PCBs have been removed from the FSM in the past two years and were destroyed at a facility in Australia. (Refer to Annex 4 for details) However, a final check of suspect locations is necessary, as it is suspected that there may be additional; contaminated sites in all states. One of these locations known to still have PCB contamination is the former LORAN Station in Yap state. The locations of remaining transformers/capacitors located in Kosrae and Chuuk States must also be investigated.

3.3.3 DDT

Mosquito borne diseases are not a typical health problem in the FSM, thus DDT use has been limited to very specific occasions, such as following major typhoon or flooding to prevent mosquito breeding. A small quantity of a DDT containing substance was removed from Pohnpei by the SPREP team.

3.3.4 Dioxins and furans

These POPs are the substances to which many residents of FSM islands are exposed. Motor emissions and trash fires are the major sources. Although some laws preventing outdoor burning are on the books, enforcement is nearly non-existent. Grass fire can be common during dry spells. Smoke from burning landfills and emissions from power plants are also identified sources of dioxins and furans.

3.3.5 Stockpiles and contaminated sites

Although a substantial amount of POPs and other dangerous substances have been removed from the country during the last two years, there are still some additional items waiting for removal and the clean-up at remaining contaminated sites needs to be completed. The identification of potential marine contamination from sunken ship is an important and urgent challenge to undertake, and therefore an action plan for such an undertaking is developed as part of this NIP. The potential threat, caused by the fuels and other substances leaking from the Japanese navy ships sunk during World War II, to both the marine environment and human health in the Chuuk Lagoon islands cannot be overstated. After more than 60 years under water, the deterioration of the metals is accelerating and the quantities remaining in many of these vessels is unknown.

3.3.6 Current level of information, awareness

At the start of the POPs project, knowledge and awareness of POPs issues in the community was non existent. As part of the POPs project, the teams in each state conducted a number of activities, including:

- Informative presentations conducted in schools
- Community workshops to discuss POPs issues;
- Distribution of flyers, pamphlets, stickers, and posters on POPs;
- Development and inclusion of POPs awareness messages in the local newspaper
- Roadside billboards on POPs
- Surveys to determine community knowledge and attitudes in relation to POPs.

Results from the public awareness surveys conducted in the states indicates that there was a measurable increase in knowledge about POPs. However, the change in behaviors that must be realized to reduce activities related to intentional and/or unintentional POPs creation have not yet been detected

Information collected for the National Profile reflected the following prioritization of environmental concerns:

1. Hazardous waste treatment/disposal
2. Marine pollution
3. Pollution of inland waterways
4. Drinking water contamination
5. Unknown chemical imports

Primarily in response to the POPs NIP project, throughout the country, interest in chemical management has marginally increased. This should facilitate the updating of laws and the provision of additional resources for chemical management in the near future. However, no new legislation is presently under consideration at either the national or state level. As a result of and upon completion of the NIP project, new laws pertaining to chemical management and solid waste management issues should be in effect in the near future .

3.3.7 POPs management infrastructure

As a result of the POPs in PICS project a core group had been created that focus solely on the matter of POPs and chemical management. The Environmental Office in HESA, and the four state offices which address environmental issues, are the foundation of the existing POPs monitoring infrastructure. Each state has established a POPs Task Force operating out of the EPA (or equivalent) office, and the national government has established a National Steering Committee. At both levels, membership is broad-based and includes representation from appropriate departments. NGO representation is included, and there is private sector participation in the some of the Task Forces and on the National Steering Committee.

Other departments, such as customs, public safety, and health services are also part of the existing infrastructure. As a result of the new concerns about bio-terrorism, trainings on the identification and safe handling of potentially hazardous materials has been conducted in each state.

3.3.8 Current impacts and effects

Due to the relatively low levels of POPs in the FSM, no specific identification of populations or environments impacted by POPs have been made. No estimation of the scale and magnitude of the threats to public health, environment or workers have been made. There will always exist the potential for severe disaster, so certain preventive and monitoring measures must be taken.

If the demand for chemical products (those which have potentially hazardous consequences in their storage, transport, handling, and disposal) increases, then there will be a need for a much more coordinated approach between the various state and national offices and other departments that are involved with chemical management activities in the nation. Responsibilities must be appropriately assigned and this is possible through inter-departmental dialog. As a means of facilitating the dialog, legal frameworks can be helpful. The effect of legal instruments are organizational assets under these circumstances.

Greater effort will need to be undertaken to determine if any health problems that relate to the use or misuse of chemical fertilizers, have been identified in the country. If the research indicates that there are health issues needing to be resolved, then more attention must be directed towards these substances.

Until more industry is operating in the FSM, little need exists for additional attention to be focused on industrial chemicals, with the notable exception of the power generating plants and the possibility of additional PCB containing items to enter the country. So far most of the power generating plants operate with little obvious or reported negative impact. However, as communities expand and more housing is built in new locations, the potential for air, water, and ground pollution to affect these communities increases. Although the raw data may exist in medical records, no statistics are available at this time that can identify health problems or major environment degradation associated with POPs.

While the danger of serious pollution resulting from spilled petroleum products always exists, very few serious incidents have been recognized in the FSM. The leaking of oil from a sunken WWII ship on an outer atoll in Yap State was a very serious problem, and the accelerating leakage of fuel and other liquids from the sunken WWII ships in Chuuk needs immediate attention.

It appears that the suppliers of bulk petroleum products in the FSM comply with international standards with regard to transport and delivery, and thus have appropriate safeguards in place. However, the storage and dispensing practices of small retailers should be carefully examined to ascertain if they are in compliance with existing regulations. Monitoring and enforcement must be strengthened in this area.

A major problem with consumer chemicals and other chemical substances in the FSM is the failure to properly dispose of unused portions and empty containers. The main issue here is the lack of properly engineered and operated disposal facilities/sanitary landfills in many areas of the country. In consideration of the relatively small population and small utilization of chemicals, this disposal issue is not a priority under the management of chemicals, but rather an infrastructure development problem that each state must, sometime very soon, address with long-term environmentally sound and sustainable solutions. Given the fragile island ecosystems, proper waste disposal is a very important issue.

3.3.9 System for the regulation of chemicals already in the market

The FSM has no suitable laboratory to test for the full range of POPs. Existing small scale laboratory tests are done at EPA, and water testing by the utilities provider, and the country‘s four main health facilities perform medical lab assessments.

Testing for POPs has been undertaken at the state level where appropriate training and equipment has been provided. Testing of soil and groundwater in and around contaminated sites requires more meticulous testing procedures and may need external technical assistance. Detailed testing for POPs will require that samples be collected and sent to external, appropriately accredited laboratories.

Besides pesticides, there is no systematic assessment and regulation of chemicals in the market or at the importation point. At this stage of time, due to the relatively small number of chemicals being imported into the FSM, government capacity is largely occupied with competing national and state priorities.

4. Strategy and Action Plans

4.1 Policy statement

The government of the FSM recognises the global threat that Persistent Organic Pollutants pose to human health and the environment. It also is committed to ensure a safe environment for the present residents and future generations, and to protect the nation's unique ecologies and biological diversity.

As part of the global community, the FSM will take actions, as specified in this National Implementation Plan for the Stockholm Convention, to reduce and eliminate the presence and releases of Persistent Organic Pollutants in the country, the region, and the world.

4.2 Implementation strategy

The FSM's National Hazardous Substances Expert Working Group (NHSEWG) will be established and serve as the overall coordinating body. This group will replace and take over the functions of the POPs National Coordinating Committee. The activities necessary to create the NHSEWG, the timeframe for completion of these activities, and the anticipated resource needs are as follows.

The establishment of the National Hazardous Substances Expert Working Group (NHSEWG) in the FSM, should be completed within six months after the project start date (MAPSD), a with subsequent NHSEWG Annual Meetings in the 2nd, 3rd and 4th years thereafter.

Establishment of the NHSEWG

List of Activities/Time Frame/Responsible Parties:

1.1 Develop draft Terms of Reference and determine size of NHSEWG membership. (by 1 MAPSD - National Government POPs Program Coordinator and POPs National Coordinating Committee)

1.2 Create list of potential members in the FSM for the NHSEWG, contact to ascertain willingness to serve, determine which willing potential members should be invited to serve. (by 3 MAPSD - National Government POPs Program Coordinator and POPs National Coordinating Committee)

1.3 Secure consultant facilitator, schedule, and convene NHSEWG organizational meeting to complete final Terms of Reference, By-laws and other organizing activities. (by 6 MAPSD - National Government POPs Program Coordinator and POPs consultant as meeting facilitator)

1.4 Schedule and convene NHSEWG Annual Meetings (suggest February), and other working meetings (suggest August) as necessary, for the 2nd, 3rd and 4th years after the endorsement of the NIP by the FSM Government. (twice yearly - NHSEWG and National Government POPs Program Coordinator)

1.5 Begin formation and provide on-going maintenance of NHSEWG files and records, including POPs and other hazardous items lists, contaminated sites lists, and other

relevant information. (continuous from 3 MAPSD following the NHSEWG's organizational meeting - National Government POPs Program Coordinator)

Performance Indicator(s): Satisfactory progress in drafting documents, collecting names of potential members, determining membership, and completion of organizational meeting with finished documentation for formalizing the NHSEWG, future meetings (2nd, 3rd and 4th years) convened, and records created and maintained.

Resource Needs (1 – 12 MAPSD):

Salary NG POPs Program Coordinator	$30,000
Computer Equipment	5,000
Office/Computer Supplies for NG POPs Program Coordinator	4,800
Communications	2,400
Consultant (0.5 months NHSEWG meeting x 1)	8,000
NHSEWG Organizing Meeting (3 days x 2 participants/state)	10,500
NHSEWG Organizing Meeting expenses	2,000
Maintenance of files/records (Computer set and office supplies)	5,000
Total	$67,700

Resources Needs (13 – 24 MAPSD):

Salary NG POPs Program Coordinator	$30,000
Office/Computer Supplies for NG POPs Program Coordinator	4,800
Communications	2,400
Consultant (0.5 months, NHSEWG meeting x 1)	8,000
NHSEWG Annual Meeting (Feb.: 3 days x 2/state)	10,500
NHSEWG Annual Meeting expenses	2,000
NHSEWG Working Meeting (Aug.: 5 days x 2/state)	12,000
NHSEWG Working Meeting expenses	3,000
Maintenance of files/records	1,000
Total	$73,700

Resources Needs (25 – 36 MAPSD):

Salary NG POPs Program Coordinator	$30,000
Office/Computer Supplies for NG POPs Program Coordinator	4,800
Communications	2,400
Consultant (0.5 months, NHSEWG meeting x 1)	8,000
NHSEWG Annual Meeting (Feb.: 3 days x 2/state)	10,500
NHSEWG Annual Meeting expenses	2,000
NHSEWG Working Meeting (Aug.: 5 days x 2/state)	12,000
NHSEWG Working Meeting expenses	3,000
Maintenance of files/records	1,000
Total	$73,700

Resources Needs (37 – 48 MAPSD):

Salary NG POPs Program Coordinator	$30,000
Office/Computer Supplies for NG POPs Program Coordinator	4,800
Communications	2,400
Consultant (0.5 months, NHSEWG meeting x 1)	8,000
NHSEWG Annual Meeting (Feb.: 3 days x 2/state)	10,500
NHSEWG Annual Meeting expenses	2,000
NHSEWG Working Meeting (Aug.: 5 days x 2/state)	12,000
NHSEWG Working Meeting expenses	3,000
Maintenance of files/records	1,000
Total	$73,700

Total (four years) $288,800

Other sub-working groups will be formed to focus on the work involved in the various action plans, and state level working groups will be formed, as needed, to assist the EPA (or equivalent) Offices with coordination of activities in each state.

At the state level, the four EPA (or equivalent) offices will be the responsible party for much of the implementation of the various activities included in his NIP. Costs specific to a particular Action Plan are included in that plan's budget, however it is necessary to financially support a minimum of two POPs Activity Coordinator positions in each state. Office equipment, supplies and communications will also need to be provided to support the work of the these state level positions. Where there is state level involvement listed in an Action Plan, this is indicated in the resource needs as follows:

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget.

The State Cross Project Budget includes:

Resource Needs (1 – 12 MAPSD):

Salary state level POPs Activity Coordinator (2 per state @ $15,000/yr)	$120,000
Office/Computer Supplies ($2,000 per state)	8,000
Communications ($1,200 per state)	4,800
Total	$132,800

Resource Needs (13 – 24 MAPSD):

Salary state level POPs Activity Coordinator (2 per state @ $15,000/yr)	$120,000
Office/Computer Supplies ($2,000 per state)	8,000
Communications ($1,200 per state)	4,800
Total	$132,800

Resource Needs (25 – 36 MAPSD):

Salary state level POPs Activity Coordinator (2 per state @ $15,000/yr)	$120,000
Office/Computer Supplies ($2,000 per state)	8,000
Communications ($1,200 per state)	4,800
Total	$132,800

Resource Needs (37 – 48 MAPSD):

Salary state level POPs Activity Coordinator (2 per state @ $15,000/yr)	$120,000
Office/Computer Supplies ($2,000 per state)	8,000
Communications ($1,200 per state)	4,800
Total	$132,800

Total (four years) $531,200

Workshops at national and state levels will provide for the dissemination of information, conduct needed trainings and coordinate monitoring efforts as required in the various action plans. External technical assistance in the form of short-term consultants will be needed, and the creation of newsletters, databases, and other electronic functions will require either internal or external capacity in this area.

The focus of POPs activities will not include the intentional production of POPs chemicals as this is non-existent in the FSM. Rather, one of the primary actions required to address intentional POPs is the implementation of effective control of importation, storage and use and disposal. This will be done through legislation and capacity building of the FSM customs service. Another FSM priority is the reduction of unintentional production of dioxins and furans.

Public education and awareness efforts will be critical in promoting general awareness of POPs in the FSM. Public education and awareness will be co-ordinated by working group to assist the state and national Departments of Education to develop a POPs Awareness Program to be included into the national school curriculum.

Various factors will influence the timing of the activities called for in the seven action plans. The plans that address legal framework development, hazardous waste removal, contaminated site clean-up, and PCB disposal, call for activities which will be conducted over a period of time and then be concluded, as the objectives will have been achieved. The other action plans call for programs and projects of a more continuous nature. Public education efforts will be on-going for a long period of time until the POPs threat is eliminated. The need to safely handle pesticides will exist as long as these chemicals are in use in the nation. As has been mentioned, leaks from old sunken ships are occurring now, and the potential for additional new spills increases with every new ship which enters the FSM's waters. Capacity building will be a long-term endeavour, the country's economic situation makes it difficult to recruit and/or retain qualified professionals, whether indigenous or expatriate.

Some of the action plans have a degree of overlap in both planning and implementation. Existing human resources are limited, however some of the public education and awareness efforts are already underway as part of the POPs in PICs supported activities. Some of the plans build on the accomplishments of others. For example, it will be necessary to complete a legal framework for the safe management of POPs and other dangerous substances before the appropriate offices and agencies can enforce new laws and regulations.

The seven action plans included in the FSM's NIP follow. Each plan includes a specific budget and timeframe for the activities in that plan. Due to uncertainty concerning the actual date when implementation activities will commence, activities are scheduled utilizing a schedule based upon "months after project start date" (MAPSD).

A combined total budget and comprehensive time frame are included in Annex 5.

4.3 Action Plans

4.3.1 Action Plan #1 - Legal Framework for the Safe Management of POPs and other Hazardous Substances

Context and Analysis of the Issue:

From the perspective of the FSM, the main international convention addressing the management of POPs and other hazardous materials is the Stockholm Convention on Persistent Organic Pollutants, which was adopted in May 2001, signed by the government of the FSM on 31 July 2001, and entered into force on 17 May 2004 (upon ratification by the 50th country). The FSM Congress adopted a Congressional Resolution (No. 13-128, on 27 January 2007) acceding to the convention and ratification was completed on 5 July 2005. Other relevant international and regional treaties and conventions that focus on management of chemicals and other hazardous substances are noted in section 3.2.3 of this document.

With regard to national and state level legal instruments concerning the management of chemicals and other hazardous materials, at the apex of FSM's legislation stands Section 2 of Article XIII of the Constitution of the Federated States of Micronesia, which states,

> "Radioactive, toxic chemical, or other harmful substances may not be tested, stored, used, or disposed of within the jurisdiction of the Federated States of Micronesia without the express approval of the national government of the Federated States of Micronesia."

Three of the four FSM States' constitutional provisions mimic Article XIII, Section 2 of the FSM Constitution. For example, the Constitution of Pohnpei states under Section 2 of Article 13 that:

> "Nuclear, chemical, gas, and biological weapons, nuclear power plants, and waste materials there from, including high-level and low-level radioactive waste, shall not be introduced, stored, used, tested, or disposed of within any part of the jurisdiction of

> Pohnpei, except if such action is specifically and expressly permitted by a majority of votes cast in a referendum by the people of Pohnpei."

The section continues,

> "The Legislature shall provide by statute for the strict control of harmful substances not listed under Subsection 1of this Section, limiting their introduction, storage, use, and disposal within the jurisdiction of Pohnpei to activities necessary for the enhancement of public health, public safety, and economic development."

The Constitution of the State of Kosrae addresses the management of chemicals and under hazardous substances under Section 2 of Article XI - Land and the Environment,

> "There may be no nuclear, chemical, gas or biological weapons, or radioactive material hazardous to public health or safety, within the State. No hazardous waste or other hazardous substances may be disposed of within the State except as expressly authorized by State law."

As for Yap State, the constitutional provision dealing with hazardous substances falls under Section 4 of Article XIII of the Constitution of the State of Yap, which states,

> "Radioactive and nuclear substances shall not be tested, stored, used or disposed of within the State."

Although the Constitution of the State of Chuuk does not specifically address management of chemicals, Section 1 of Article XI of the Chuuk Constitution addresses the issue generally. Section 1 of Article XI states,

> "The Legislature shall provide by law for the development and enforcement of standards of environmental quality, and for the establishment of an independent state agency vested with the responsibility for environmental matters."

Although the national and state governments' respective constitutions address the issue of managing hazardous substances, the weak management of hazardous substances in the country still exists due to the absence of more specific and uniform laws and regulations at the national and state level.

Almost all of the Existing laws and regulations at the national and state levels are primarily based on the former Trust Territory laws and regulations relating to pesticides and solid waste. There is need for these to be reviewed and updated.

Goals and Objectives:

The main goal for this action plan is to develop and implement an effective legal framework for the environmentally sound management of POPs and other hazardous substances in order to: (1) protect the health of the people of the FSM and their environment from such pollutants; and (2)

comply with the FSM's international obligations under the Stockholm Convention and other international and regional conventions.

To effectively and efficiently meet this goal, the following five objectives must be effectively and efficiently carried out. The five objectives are:

1. To recruit, by 6 MAPSD, the necessary legal expertise to carry out Objective #s 2 through 5 in this action plan..

2. To draft and present, within 18 MAPSD (or one year following the completion of Objective #1), to the respective legislative bodies in the national and state governments, legislative bills directing that reasonable, environmentally sound measures be implemented to eliminate, or reduce to the greatest extent possible, the use of POPs; eliminate the unintentional creation and release of POPs; and provide for the safe disposal of stockpiles of POPs and other hazardous substances and hazardous substances.

3. To have enacted, within 30 MAPSD (or one year following completion of Objective #2), the legislative bills presented to the respective state and national legislative bodies under Objective 2.

4. To promulgate, within 36 MAPSD (or six months following completion of Objective #3), regulations detailing the procedures for the effective implementation and enforcement of laws enacted under Objective 3.

5. To conduct, within 48 MAPSD (or one year following completion of Objective #4), a national workshop to assess the progress, strengths, and weaknesses of the implemented legal mechanism and to determine whether or not further amendments to the laws and regulations are necessary, and if so prepare such further amendments.

Relevant Management Options

One option is to contract a lawyer or a consultant specialized in chemical management to draft legislation to manage POPs and other hazardous substances in the FSM. This individual would consult with the state and national legal departments. A second option is to utilize the existing national and state legislature lawyers, AG's Offices and EPA lawyers to form a National Hazardous Substances Legal Framework Development Task Force.

Criteria For Evaluation and Prioritization of Options

It is highly recommended that Option 1 should be chosen. This recommendation is supported by the following considerations:

1. A concentrated approach to this action plan is crucial and having a lawyer to focus on the issues of this action plan while assisting the respective state's legal groups would be more effective as this work will be the individual's only assigned task.

2. The state and national lawyers would always still be involved with the drafting of laws and regulations and thus unable to entirely focus attention on the POPs work.

3. It eliminates the possibility that this action plan will be placed on hold due to pressing matters unrelated to the POPs issue.

Action Plan Implementation Strategy

The strategy to be employed for this action plan is to secure technical assistance to complete a review of the existing legislation and regulations in the country and also examine relevant legislation and regulations in other Pacific island countries that have similar situations to the FSM. Following this review, the necessary new legislation will be drafted and submitted to the national and state legislative assemblies for action, while a public education effort is conducted to generate awareness of the POPs and other hazardous substance situation in the nation. New laws and regulations will be established with public hearings conducted to get input from the public. Finally, after the laws and regulation have been in effect for a year, a national workshop will be held to analyse the impact and make recommendations for needed changes.

Objective #1 - To recruit, by 6 MAPSD, the necessary legal expertise to carry out Objectives 2 through 5.in this action plan.

List of Activities/Time Frame/Responsible Parties

1.1 Announce availability of contract for lawyer or legal consultant to draft legislation and regulations on the management of POPs and other hazardous substances. (within 2 MAPSD - POPs Program Coordinator)

1.2 Recruit lawyer or consultant. (within 6 MAPSD – NG POPs Program Coordinator).

Performance Indicator(s): Announcement publicized and recruitment of the necessary legal expertise completed.

Resource Needs (1 - 12 MAPSD):

Contractual Services - FSM POPs lawyer or legal consultant (6 months) $25,000

Resource Needs (13 - 24 MAPSD):

Contractual Services - FSM POPs lawyer or legal consultant (6 months) $25,000

Objective #1 Total.....$50,000

Objective #2 - To draft and present, within 18 MAPSD, to the respective legislative bodies in the national and state governments legislative bills directing that reasonable, environmentally sound measures be implemented to eliminate, or reduce to the greatest extent possible, the use of POPs; eliminate the unintentional creation and release of POPs; and provide for the safe disposal of stockpiles of POPs and other hazardous substances and hazardous substances.

List of Activities/Time Frame/Responsible Parties

2.1 Review all of the international conventions including neighboring island nations' current laws governing the import, transport, storage, and disposal of POPs and other hazardous substances. (By 9 MAPSD - FSM POPs lawyer).

2.2 Review all existing laws at the national and state levels to identify their current weaknesses; and determine whether such laws should be amended or new and more specific legislative bills should be drafted to:

i. Set up measures to prohibit the importation, use, and in-country disposal of any chemical listed under Annex A of the Stockholm Convention.
ii. Define limitations for the storage, in-country transport and over-seas export of POPs and other hazardous substances that are or yet to be collected and identified in FSM.
iii. Set up measures to prohibit the trans-boundary movement of POPs and other hazardous substances in FSM's exclusive economic zones;
iv. Define limitations for the importation, use, storage, in-country transport and exportation of any of the chemicals listed in Annex B of the Stockholm Convention;
v. Define the limits to the unintentional production of the chemicals listed under Annex C of the Stockholm Convention;
vi. Define appropriate environmentally sound measures for handling, collecting, transporting and storing stockpiles and substances in the FSM (environmentally sound measures should be chosen in accordance to the present social and economic circumstances to FSM);
vii. Delineate the responsibilities connected to POPs and other hazardous substances that are located on past and future sunken or grounded vessels.
viii. Identify a government agency tasked with the responsibility to inspect, report, monitor POPs and other hazardous substances in FSM.
ix. Define enforcement mechanism to address violation of law.

Review and determinations to be completed by 12 MAPSD - POPs lawyer.

2.3. Draft and present necessary legislation to appropriate bodies. (By 18 MAPSD – POPs lawyer.)

Performance Indicators: Satisfactory progress in reviewing international conventions, neighboring nations' current laws, existing FSM national and state laws and drafting and presenting legislation,

Resource Needs (1 - 12 MAPSD):

Communications (POPs Lawyer) $2,400
Travel - consultation with Kosrae, Chuuk, Yap State legal departments 6,000

Resource Needs (13 - 24 MAPSD):

Office Support..... included in NG POPs Coordinator Budget

Objective #2 Total.....$8,400

Objective 3 - To have enacted, within 30 MAPSD, the legislative bills presented to the respective state and national legislative bodies under Objective 2.

List of Activities/Time Frame/Responsible Parties

3.1 Conduct public awareness programs (newspaper, television, radio, internet, etc) to government leaders, private sectors, and communities on the importance of encouraging their leaders to enact the legislative bills under Objective 2. (By 30 MAPSD - NG POPs Program Coordinator and State POPs Program/EPA Offices).

Performance Indicators: Public awareness programs conducted in each state, satisfactory progress in enacting legislation for management of POPs and other hazardous substances at the state and national levels.

Resource Needs (25 – 36 MAPSD):

Travel – NG POPS Coordinator Kosrae, Chuuk, Yap.....$6,000
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
State Awareness program equipment (projector x 4) 4,000
State Awareness program materials ($2,000 / state).....8,000

Objective #3 Total.....$18,000

Objective #4 - To promulgate, within 36 MAPSD, the regulations detailing the procedures for the effective implementation and enforcement of laws enacted under Objective 3.

List of Activities/Time Frame/Responsible Parties

4.1 Recruit and contract lawyer/ legal consultant for six months. (By 31 MAPSD - NG POPs Program Coordinator).
4.2 Review and assess procedures currently in place that deal with chemical management at the national and state level. (By 33 MAPSD - POPs Lawyer).
4.3 Draft proposed regulations regarding specific management and enforcement procedures for POPs and other hazardous substances and substances in the FSM (By 36 MAPSD - POPs Lawyer).
4.4 Conduct public state level awareness programs (newspaper, television, radio, internet) with government leaders, private sectors, and communities on the proposed national and state regulations. (By 39 MAPSD - NG POPs Program Coordinator and State POPs Program/EPA Offices).
4.5 Adopt proposed regulations. (By 42 MAPSD – National/State Responsible Agencies)

Performance Indicators: As scheduled, secure lawyer, conduct review, draft regulations, conduct public awareness programs, and adopt regulations.

Resource Needs (25 – 36 MAPSD):

Contractual Services - FSM POPs lawyer or legal consultant (3 months) $15,000

Resource Needs (37 – 48 MAPSD):

Contractual Services - FSM POPs lawyer or legal consultant (3 months) $15,000
Travel – NG POPS Coordinator and Consultant - Kosrae, Chuuk, Yap 12,000
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Public awareness Program and Hearings (avg. $2,000 per State) 8,000

Total $35,000

Objective #4 Total.....$50,000

Objective 5 - To conduct, within 48 MAPSD, four state and one national workshops to assess the progress, strengths, and weaknesses of the implemented legal mechanism and to determine whether or not further amendments to the laws and regulations are necessary, and if so prepare such further amendments.

List of Activities/Time Frame/Responsible Parties

5.1 Schedule public workshops in each state to review progress, strengths, weaknesses of the regulations. (By 46 MAPSD – NG POPs Program Coordinator and State POPs Program/EPA Offices).

5.2 Conduct national workshop. (By 48 MAPSD – NG POPs Program Coordinator, NHSEWG, Representatives from four State POPs Program/EPA Offices).

Performance Indicators: As scheduled, conduct state level public workshops, conduct national workshop.

Resource Needs (37 – 48 MAPSD):

Travel – NG POPS Coordinator Kosrae, Chuuk, Yap.....$6,000
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
State level Meeting expenses (avg. $2,000.00 per state) 8,000
National Workshop (State EPA Staff - 2/state – 1 week).....12,000
National Workshop expenses.....2,000

Objective #5 Total.....$28,000

Action Plan #1 - Total Budget $154,400

4.3.2 Action Plan #2 - Hazardous Substances Storage, Disposal, Contaminated Site Clean-Up

Context and Analysis of the Issue:

In the Federated States of Micronesia, a priority concern is the potential for nearby ocean waters and marine environments, inland waterways and streams, and soils, to be contaminated by

hazardous substances, including persistent organic pollutants (POPs). An equally important, but more urgent priority is human morbidity and mortality due to direct exposure to toxic materials, and indirect exposure by consumption of contaminated food stuffs and/or water. This is a very real possibility if these dangerous substances are not properly used, stored and disposed. A number of these dangerous substances have been introduced to the islands of the nation in the years dating back to WWII and possibly earlier. Many of these substances may have been used during the construction of the various islands' physical infrastructure when the hazardous properties of the substances were not yet known. Other hazardous materials have been brought to the FSM in the form of pesticides, insecticides, fertilizers, and in various kinds of equipment. Although the number and quantities of these hazardous substances may be relatively small in comparison to amounts in larger and more developed countries, the small size and fragile environments of the nation's islands result in a situation in which even "small" quantities of a contaminant may pose grave and irreparable damage to delicate marine and land-based eco-systems, in addition to numerous health problems.

FSM laws ban or restrict the importation of many dangerous substances, including most POPs containing substances into the country. State Environmental Protection Agency (EPA, or the equivalent) Offices require registration of all pesticides or insecticides brought into the country. However, imports of hazardous materials occurred during the Trust Territory period, perhaps before, and also in more recent times. Inspection of imports by customs officials does not cover 100% of all shipping containers and other packages brought into the country. Furthermore, the inspection of imports is primarily performed by officers of the Department of Finance who are determining tax assessments, or by staff of the Quarantine Office who are searching for agricultural threats. None of these inspectors is tasked to identify hazardous chemicals or similar substances, nor have they received any training for this task. A specific level of certification would be required to do this type of work.

Personnel in each of the four states now have the capacity to test for PCBs, but not all POPs and other hazardous substances. Test kits are available for PCBs and training on the use of these kits has been conducted. For other substances, different kits and associated trainings will be needed. External expertise will be necessary to provide this training and also to assist with identification as necessary. Local (in-country) laboratory capacity is not sufficient to test and identify most POPs and other hazardous substances. The assistance of out-of-country laboratory services will be necessary. If not presently available, protective gear for the work will be required.

At the present time, in each FSM state, a number of hazardous and potentially hazardous materials have been identified by EPA personnel during the second phase of the POPs project. Inventories have been compiled listing the pertinent details of these identified substances. Many of these materials have been collected and stockpiled in the state centers, but some have not, and remain located where human exposure or environmental contamination is possible. The possibility still exists that other unidentified hazardous materials remain at undetermined locations. The assistance of the general public will be required for the identification of other potential remaining POPs and other hazardous substances, and their locations.

As substances are identified, decisions will be made to determine the next steps. Some materials may be reused if a legitimate need exists and any potential negative effects can be avoided or

sufficiently minimized to reduce human or environmental harm to acceptable levels. All other POPs and other hazardous substances must be disposed in an environmentally sound manner either in-country or overseas. The needs for appropriate storage and disposal methods for each particular substance must be determined. Overseas disposal is the only option for many POPs and other hazardous substances, thus secure storage in a safe facility is necessary until export is possible. The current situation with regard to storage sites for POPs and other hazardous substances is that each state has established a provisional facility, but the structures and their locations may not meet the safety specifications necessary for storage of such toxic materials.

The clean up of contaminated sites completes the action plan, it is the last step in the process of restoration of the land to a safe status similar to pre-contamination days. Identification, assessment, and rehabilitation may require some expertise beyond that available in-country. The involvement of the public is necessary as it is possible that additional contaminated sites may be discovered. The on-going task of checking for contaminated sites cannot be totally abandoned until the import of POPs is completely under control. The recognition that there may be remaining unidentified sites and that the continued monitoring of known sites has to continue, must be an underlying component of an overall chemical management plan.

Presently, no formally organized pool of expertise in the area of hazardous waste management exists in the FSM. The state EPA offices have varied, but limited, levels of capacity depending on past educational attainments of the staff and other relevant trainings which have been provided, including workshops, on-the-job instruction and more formal courses at overseas institutions or laboratories. There is a need to develop and organize an appropriate local body of POPs and other hazardous substances expertise so that appropriate in-country capacity exists to address problems in this important area. Lower in-country costs could be realized by utilizing a regional approach to some of the work.

Goals And Objectives

The overall goal for this action plan is to identify, collect, place into secure storage, and ultimately dispose of all existing stockpiles of POPs substances, obsolete chemicals, and other hazardous substances from the territory of the Federated States of Micronesia, and to restore any contaminated sites to a safe condition. There are seven main objectives to be met in order to reach this goal.

1. To complete, by 12 MAPSD, a comprehensive inventory of all POPs and other hazardous substances in the country, including those presently known and as many of the unknown as can be discovered and identified.
2. To construct, by 24 MAPSD, an appropriate storage facility, or facilities, for POPs and other hazardous substances in each FSM state.
3. To collect and transport, by 36 MAPSD, all identified POPs and other hazardous substances to the storage facilities and prepare them for off-island disposal or other appropriate disposition.
4. To export, by 48 MAPSD, all collected POPs and other hazardous substances from each state's storage facility to an out-of-country disposal facility.

5. To, by 48 MAPSD, work to rehabilitate or otherwise eliminate any possibility of being a source of toxic exposure, all known and as many as possible of the yet-to-be discovered, contaminated sites in the country.
6. To, by 48 MAPSD, establish a system that will 1) monitor all sites (rehabilitated or still contaminated) until no longer necessary, and 2) facilitate the identification of any overlooked or recently contaminated sites.

Relevant Management Options

This project, targeting the identification, collection, storage, and disposal of POPs and other hazardous substances in the FSM, and the follow-up decontamination of polluted sites, is a relatively straightforward effort, although the scope of the work to be done is substantial. Accompanying activities to be considered relevant to the project would include the development of national and state level legislation, improving in-country expertise, the manner of reporting the progress of the project to the National Government, and options concerning the possibility of increasing the number of storage facilities to reduce the need for dangerous transportation of POPs and other hazardous substances between islands.

A decision to utilize professional, private sector expertise to conduct the collection and transport of POPs and other hazardous substances to the storage facilities can also be considered. The same issue must be addressed to determine if in-country disposal of POPs and other hazardous substances is an option. Other possible management options would include hiring consultants, and adjusting the schedule of activities.

It will be necessary to secure the services of overseas laboratories for testing of unknown substances. Local capacity should be developed to the extent that it is cost effective to address the local demand. Otherwise, for analysis which requires a level of skill or analytical hardware beyond the local capacity, out-of-country facilities must be utilized. This will require that local staff be given training in sample collection and preparation of the samples for shipping to overseas locations. Regional cooperation among neighbouring nations by sharing certain aspects of foreign expertise for laboratory analysis or training programs could reduce per-country expenses.

After substances are identified, it will be necessary to then determine subsequent disposition action. Since there are no means in the FSM to safely destroy POPs or other hazardous materials, it is anticipated that all such substances will be sent out-of-country for final disposal. In the event that in-country destruction is an alternative, the storage facility to be constructed in each state would include this function in its design.

In the improbable event that out-of-country disposal is impossible due to the nature of a particular hazardous material or other considerations, a permanent disposal site will need to be established within the FSM. As with any POPs polluted site which cannot be decontaminated, a permanent disposal site would require secure boundaries and subsequent monitoring.

The legal mechanism in the country, which specifically addresses the issues of collection, storage, and disposal of POPs and other hazardous substances, is, at the present time, very

limited. Most regulations address import and registration. No organized technical expert group exists in the country to direct activities in this area. The development of in-country expertise would result in more relevant and accurate information being provided to the nation's leadership regarding the development of legislation addressing all aspects of hazardous substances management, including identification, collection, storage, and disposal. It is anticipated that, encouraged by the present need, an FSM national, who is devoted to the notion that he or she is protecting the islands that have supported the lives of family and ancestors, may have the commitment and enthusiasm to become a champion of this important work.

It is unlikely, but the possibility exists, that an identified POPs or other hazardous item may currently be in use, or may have value for a potential future use by some individual, business, or other entity. Each such case will need to be investigated, and a determination made based on scientific evidence, existing local regulations (if any), or by relevant international agreements, if applicable. Any such action will be handled by the FSM National Government's Environmental Office, or one of the four state Environmental Protection Offices (or equivalent) as deemed appropriate. The legal opportunity that is presented by the investigation to permit use, or entry, of a questionable substance, should also be utilized as an occasion to update the national and state laws and regulations concerning POPs and chemical management in general.

The use, as opposed to the destruction or removal, of any POPs and other hazardous items must be carried out in a manner which, and in areas where, the possibility of human exposure or release into the environment is minimized to an acceptable extent. This use must be completed as soon as possible after identification, ideally within two years following the start of the hazardous waste identification, collection, storage, and disposal project. During this two year period, any use of POPs and other hazardous items must be monitored on a continual basis, following a schedule developed by the state Environmental Protection Offices (or equivalent). Monitoring reports should be submitted to the appropriate offices until the use of the hazardous material is fully completed.

The overall legal framework to support all of the above will be completed in the accompanying Action Plan dealing with the legal aspects of chemical management. When completed, the legal framework must prohibit the import of any POPs and other hazardous items and require that any such material which is discovered in the FSM must be immediately reported to the appropriate authority, either the state Environmental Protection Offices (or equivalent), or the police. Law enforcement officers may require training to instruct them on the safety procedures associated with POPs and other hazardous items.

Reporting requirements (content and schedules) relevant to the project will need to be established. Necessary information will include details (nature, volume, condition, etc.) of the POPs and other hazardous substances that are identified, the locations of contaminated sites, the progress of the collection activities, and available transport alternatives. Additional information to be conveyed should include an analysis of safety concerns, status of storage facility construction, inventories, and finally the progress of disposal efforts. Monitoring reports on the rehabilitation of polluted sites will be ongoing until sites are deemed by knowledgeable authorities to be completely decontaminated and safe.

The management and security of storage facilities must also be carefully considered. Information on inventories will need to be maintained, and regular monitoring of the substances and their containers will be necessary. Rapid response strategies to promptly address any possible leaks or discharges of POPs or other hazardous substances will need to be prepared, as will a response plan to deal with possible damage sustained from natural disasters, particularly typhoon force winds, or floods caused by typhoons or tides. The eventual remediation of storage sites no longer in use is a final activity to be arranged in conjunction with the clean up of contaminated sites.

The effort needed to restore the sites that have been contaminated with POPs and other hazardous substances will require expertise in risk assessment, testing and monitoring, land and legal issues, public relations and awareness education, and soil rehabilitation. All of the locations which have had POPs and other hazardous substances removed will require testing, and if needed, decontamination.

There is the possibility that other, as yet unidentified contaminated sites exist, where more POPs and other hazardous substances may be discovered. It is also possible that contaminated areas may no longer have any visual evidence of the contaminating agent. Public health statistics and other information can be utilized to help identify pollution source sites. Health care providers need to be informed of symptoms and treatments, and what a sudden increase of the incidence levels of certain toxic-reaction illnesses may indicate. Public education/awareness building information needs to explain to people how to identify a possible contaminated site, how to interpret personal medical problems due to POPs or other hazardous substance exposure, and then who to contact. Guidelines for safety must be provided at all levels.

After being identified, contaminated sites will need testing, removal of any POPs, and then removal or neutralization of contaminated soils and other materials. Sites which cannot be restored must be cordoned off, secured, and posted to prevent any possibility of further environmental or human exposure episodes. Monitoring must continue, following the full completion of the restoration effort, until the time when an area can be certified to be absolutely clean and safe.

Training of local staff may be needed to ensure that the packaging of all materials, in preparation for overseas transport, is performed in compliance with applicable national and international regulations and specifications. External technical assistance may be required, and may be needed prior to the departure of any shipment from the FSM. All shipping arrangements and eventual acceptance at the destination port will need proper communication and coordination among all concerned parties.

The need to safely manage chemicals, whether the substance is one of the twelve POPs or any other potentially dangerous chemical, is an essential public safeguard. This need will not disappear in the near future and even the final elimination of the first twelve POPs will not signal the end. Many materials in use today are hazardous, usually not at a level equivalent to our present POPs, but these items may need to be controlled nonetheless. It is also likely that additional substances may be added to the POPs list in the future. To provide long term direction, and to maintain the professional safety certification standards necessary for chemical

management in the FSM requires a joint national and state level oversight body. The "National Hazardous Waste Expert Group" would be formed of members with insight and expertise in various aspects of the hazardous waste issue and would represent international, national, and state interests.

Criteria For Evaluation And Prioritization Of Options

If currently available local expertise determines that additional assistance is needed to complete some of the tasks or activities involved with hazardous waste storage, disposal, and contaminated site clean-up, then a consultant with expertise in the area of POPs and hazardous substances should be recruited. This expert would assist the FSM National Government's Environmental Office and the four state Environmental Protection Offices (or equivalent) with identifying what other substances or items, in addition to those already identified during the second phase of the POPs Project, may likely be found on the nation's islands, atolls and reefs, and in fresh waters, lagoons, and oceans. This information will be used to create a list of items that may be present in the country, which will assist in focusing the search effort. The identification of potential contaminated sites in addition to those already identified is a task that should also be included in the terms of reference for this work. Furthermore, the consultant can assist with the design of the awareness campaign to first inform the general public of the dangers and familiarize them with the related activities, and next, to involve residents in the hazardous waste and contaminated site identification effort. The terms of reference for this consultant must clearly identify the up-scaling of local capacity as a critical component of the contact.

The scheduling of the activities for this project may be accelerated if objectives are completed ahead of the suggested timeline, and if funds are available to move on to the next step. The identification and collection of all POPs and other hazardous items at the storage facilities should be completed as soon as possible, to minimize any further human or environmental exposures. Once these hazardous items are in storage, the schedule can be adjusted as determined by the arrangements for the next step, or by resource availability. However, as soon as the transport, or any alternative disposition requirements are understood, it will be best that removal and disposal be scheduled as expeditiously as possible.

Since the storage facilities must be continuously monitored to prevent any possible containment problems, arrangements for removal to off-island disposal facilities should be completed without undue delay. Good communication among all of the various offices involved in the collection and storage effort, and between the national level coordinator and the transporting services, will be essential to achieve an effective, well synchronized removal effort.

The course of action to be followed once the POPs and other hazardous items are removed from a specific location, will involve an analysis of the level of contamination remaining at the site and the determination of the efforts necessary to rehabilitate the area. It is anticipated that all toxic substances would be removed during the first collection work, and transported to the storage facilities. However, a possibility exists that remaining toxic material may be discovered, thus an additional final contamination analysis of the site will be necessary as one of the initial steps of the rehabilitation effort.

At the storage facility, the determination can be made to ship the substances off island, permanently store, or neutralize the hazardous substance. The design of the storage structures must reflect the scope of the various functions that the facility will provide. The range of functions may include: temporary and short term storage; long term, possibly permanent storage; or the structure may house the process needed which would neutralize certain of the POPs or other hazardous substances. At a point during the identification and collection process, a reliable estimate of the variety and volume of the different substances will be possible, and a quick calculation of the functions that will need to be incorporated into the design of the storage structures would then be determined.

The number of storage facilities depends on the amount of POPs and other hazardous items that are identified and their locations. It is anticipated that most of these items will be located in the state centers; however some items may be found on other islands and atolls. The cost and danger of transporting these items must be balanced against the cost of an additional storage facility and the ability of the ship, which will eventually remove the items to another island for storage in anticipation of out-of-country disposal, to safely collect the items at each location. Provided that the POPs and other hazardous items can be safely packaged, it is envisioned that the state field trip ships will be able to transport the items to the storage facilities in the state centers.

Depending upon the port or dock capabilities at islands with quantities of POPs and other hazardous material waiting for removal and the requirements of the removal transport vessel, it may not be necessary to first ship items to the state centers. It may be safer and more cost effective for the removal vessel to visit all of the islands with docks capable of handling such a ship. This determination will need to wait for the final inventory of items needing to be transported so that accurate assessments of quantities and safety considerations can be completed.

Subject to the results of the surveys to identify all of the remaining POPs and other hazardous items in the country, it may be more cost effective to secure the services of out-of-country experts to collect and transport the identified items. The capacity of local experts and the availability of necessary transport and protective equipment will need to be assessed, and then the cost to complete the necessary work calculated. The terms of reference identified from this calculation can then be utilized to develop a request for proposals from external experts. Careful cost comparisons would then identify the most cost-efficient options. Safety concerns must also be considered.

The same analysis should be considered concerning the rehabilitation of the nation's contaminated sites. The local capacity, both human and material, must be evaluated to determine whether to employ local, versus out-of-country expertise to implement activities related to the clean up of contaminated sites. Until an appropriate level of local monitoring capacity exists, external expertise may be necessary.

Action Plan Implementation Strategy

The coordination of this POPs and other hazardous items identification, collection, storage, and disposal project and the restoration of contaminated sites, will involve the FSM-HESA's

Environmental Office, the four state Environmental Protection Offices (or equivalent), and other entities (perhaps local NGO's and the media) for activities involved with the awareness campaign to secure the assistance of the general public to identify the locations of any remaining POPs and other hazardous items in the country. The services of a consultant with knowledge regarding POPs and other hazardous items may be necessary. The consultant can also assist with the effort to create an improved level of in-country management expertise with POPs and other hazardous items. The development of the National Hazardous Waste Expert Group is an essential component to the long-term effectiveness of this hazardous waste identification, collection, storage, disposal, and contaminated site restoration project, as well as to the continuing overall safe management of chemicals in the country.

The FSM National Government's Environmental Office will be responsible for securing the technical assistance necessary in order to support the activities of each state as they complete the comprehensive inventory of any known POPs and other hazardous items, identify any remaining POPs and other hazardous items, coordinate the services of overseas laboratories, provide specifications for the construction of storage facilities, and also for the arrangements necessary for the transport of the items out of the country for final disposal at an appropriate overseas facility. The procurement of any external expertise necessary to complete the final assessment and decontamination of polluted sites in each FSM state, and the effort to identify any, as yet, undiscovered contaminated sites would also fall under the responsibilities of that office. Ongoing effective coordination with the state level organizations will be needed for the successful execution of these tasks.

The responsibilities of the four state Environmental Protection Offices (or equivalent) will include the actual state-wide survey to identify any remaining POPs and other hazardous items beyond the known items (in conjunction with the technical support provided by the NG), the construction of storage facilities, the collection and transport of all POPs and other hazardous items to the storage facilities, and the proper packaging of these items for eventual removal.

States will need to conduct the final site assessment and rehabilitation/restoration activities as needed. Although it is expected that all hazardous and contaminated materials will be removed from sites during the main identification and transport phase, it is possible that some dangerous materials may still be discovered as these polluted sites are examined. This contingency will be addressed in the implementation strategy. Monitoring of decontaminated sites will be on-going until testing reveals an acceptable level for the safeguarding of the population and environment. The storage facilities and any site that cannot be decontaminated must be monitored on a continuing basis, and secured from public access.

The work plan containing each of the numbered objectives above is as follows:

Objective #1 - To complete, by 12 MAPSD, a comprehensive inventory of all POPs and other hazardous substances in the country, including those presently known and as many of the unknown as can be discovered and identified.

List of Activities/Time Frame/Responsible Parties:

1.1 Create list of all Known "potential items and suspected sites", in the FSM, that may contain POPs and other hazardous items. List will be maintained on a permanent basis at the National Government POPs Program Office. (by 6 MAPSD - National Government POPs Program Coordinator, and short term consultant who will provide national training workshop on this topic)

1.2 Public Service Announcements (seeking assistance from the general public with POPs and other hazardous items identification) created, translated, and broadcast; information further disseminated by NGO efforts; system developed in each state to record and add responses to the "potential items and suspected sites" list (by 6 MAPSD – National Government POPs Program Coordinator and staff of each state Environmental Protection Office)

1.3 Identify and contract with overseas laboratories to provide analytical services as needed. (by 12 MAPSD - National Government POPs Program Coordinator)

1.4 Identify and procure needed test kits, protective gear, and other necessary tools and equipment. (by 12 MAPSD – Staff of each state Environmental Protection Office identifying needs, procurement arrangements coordinated by National Government POPs Program Coordinator)

1.5 Physically locate and identify items and sites identified on the "potential items and suspected sites" list, including responses from the general public, and classify as "non-hazardous" or "requiring further action". Complete log description of details concerning each "further action" item. (12 to 24 MAPSD – Staff of each state Environmental Protection Office)

1.6 As necessary, package and ship samples to contracted laboratories. As results reports are received, add items/sites to "requiring further action" list, if hazardous. (ongoing from 12 MAPSD – Staff of each state Environmental Protection Office responsible for shipping, and arrangements coordinated by National Government POPs Program Coordinator)

Performance Indicator(s): Satisfactory (as scheduled) progress in creation of lists, training workshop conducted, laboratory contract(s) arranged, equipment procured, Public Service Announcements broadcast, "requiring further action" log completed, sample reports received from overseas laboratories. Activities at state level reported quarterly from state Environmental Protection Offices to National Government Pop's Program Coordinator.

Resource Needs (1 – 12 MAPSD):

Consultant (1.0 months)	$16,000
National Training Workshop (state EPA staff - 2/state – 1 week)	12,000
National Training Workshop expenses	2,000
Public Service Announcements – printing & reproduction	8,000
Public Service Announcements - broadcast fees	2,000
State POPs Program/EPA Office remuneration	in State Cross-Project Budget
Testing equipment, protective gear	12,000
Laboratory contracts – samples identification	10,000
Samples packaging/shipping costs	8,000
Intra-state travel (land and sea)	10,000
Total	$80,000

Resource Needs (13 - 24 MAPSD):

Public Service Announcement - broadcast fees	$2,000
State POPs Program/EPA Office remuneration	in State Cross-Project Budget
Equipment maintenance (avg. $1,000/state)	4,000
Laboratory contracts – samples identification	10,000
Samples packaging/shipping costs	8,000
Intra-state travel (land and sea)	10,000
Total	$34,000

Objective #1 Total.....$114,000

Objective #2 - To construct, by 24 MAPSD, an appropriate storage facility, or facilities, for POPs and other hazardous substances in each FSM state.

List of Activities/Time Frame/Responsible Parties:

2.1 Utilizing the information gathered for Objective #1, determine the size and other specifications necessary for construction of a storage facility in each state. If the quantity of items found in locations other than the state centers warrant additional storage facilities outside of the state centers, determine the specifications for these structures also. If a facility is to be utilized for permanent storage or to provide a destruction processing function, these considerations must be included in the design. (15-18 MAPSD – Staff of each state Environmental Protection Office in consultation with National Government POPs Program Coordinator and design consultant/engineer)

2.2 Determine the best available location for each storage facility. (15-18 MAPSD – Staff of each state Environmental Protection Office)

2.3 Arrange for a qualified contractor to construct storage facilities as planned in steps #'s 1 and 2 and commence construction. (18-24 MAPSD – Monitored by National Government POPs Program Coordinator and staff of each state Environmental Protection Office)

2.4 Arrange for a appropriate professional maintenance and monitoring of storage facilities in each state. (on-going from 25 MAPSD – Supervision by staff of each state Environmental Protection Office)

Performance Indicator(s): Satisfactory progress/schedule in developing building specifications, determining locations, and completing construction. Regularly progress reports from state Environmental Protection Offices will be submitted to National Government POPs Program Coordinator.

Resources Needs (13 – 24 MAPSD):

Contractual Services – Construction design of four (4) storage facilities (assuming one facility per state) at an avg. cost/state of $10,000	$40,000
Contractual Services – Construction of four (4) storage facilities (assuming one facility per state) at an avg. cost/state of $75,000	$300,000

Resources Needs (25 – 36 MAPSD):

Facility Maintenance ($2,500/state x 4).....$10,000

Resources Needs (37 – 48 MAPSD):

Facility Maintenance ($2,500/state x 4).....$10,000

Objective #2 Total.....$360,000

Objective #3 - To collect and transport, by 36 MAPSD, all identified POPs and other hazardous substances to the storage facilities and prepare them for off-island disposal, or other appropriate action.

List of Activities/Time Frame/Responsible Parties:

3.1 Arrange for appropriate state vehicles/boats/ship (and necessary POL) to transport items included on each state's "further action" list to the assigned storage facility (as necessary from 25 -36 MAPSD – Staff of each state Environmental Protection Office, Transportation Office in each state for outer island transport as necessary)

3.2 Schedule packaging and collection activities/availability of vehicles and boats/ships (as necessary from 25 - 36 MAPSD – Staff of each state Environmental Protection Office, Transportation Office in each state for outer island transport as necessary)

3.3 Determine the disposition of each substance (out-of-country disposal, in-country destruction, or long-term in-country storage – utilizing the information gathered in Objective #2 (30 - 36 MAPSD – Staff of each state Environmental Protection Office, National Government POPs Program Coordinator)

3.4 Perform in-state disposal of select items (30 - 36 MAPSD – Staff of each state Environmental Protection Office or contractor)

3.5 At each storage facility, package items as necessary for removal to out-of-country disposal. (30 - 36 MAPSD – Staff of each state Environmental Protection Office)

Performance Indicator(s): Satisfactory progress in transport of POPs and other hazardous items as evidenced by arrival at storage facilities, and packing of items, as reported quarterly from state Environmental Protection Offices to National Government POPs Program Coordinator.

Resources Needs (25 – 36MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Intra-state POL or freight charges (est. avg. of $5,000/state).....$20,000
Packaging materials for intra-state transport (est. avg. of $3,000/state).....12,000
In-state disposal (estimated avg. of $10,000/state).....40,000
Packaging materials for export transport disposal (est. avg. of $3,000/state) 12,000

Objective #3 Total.....$84,000

Objective #4 - To export, by 48 MAPSD, all collected POPs and other hazardous substances from each state's storage facility to an out-of-country disposal facility.

List of Activities/Time Frame/Responsible Parties:

4.1 Identify and initiate arrangements with facility that will be responsible for the disposal /destruction of the PCB containing items. (by 27 MAPSD - National Government POPs Program Coordinator)

4.2 Identify and initiate arrangements with shipping company that has capability to transport POPs and other hazardous items from the FSM to the disposal facility. (by 27 MAPSD - National Government POPs Program Coordinator)

4.3 Complete necessary permits and other paperwork to comply with regulation of the Basel Convention on the Control of Trans-boundary Movement of Hazardous Waste and their Disposal, and any other relevant national, regional, or international control instruments. (by 33 MAPSD - National Government POPs Program Coordinator)

4.4 In consultation with disposal facility, shipping company, and State Environmental Protection Offices, establish schedule of ship arrivals at each FSM state. (34 - 36 MAPSD - National Government POPs Program Coordinator)

4.5 Provide ship arrival information to State Environmental Protection Offices, giving sufficient lead time for Staff of each state Environmental Protection Office to arrange for items to be transported to the dock. (37 - 45 MAPSD, as necessary - National Government POPs Program Coordinator and Staff of each state Environmental Protection Office)

4.6 Upon successful pick up, inform the disposal facility that collection has occurred and provide estimated date of arrival. (37 - 45 MAPSD, as necessary - National Government POPs Program Coordinator)

Performance Indicator(s): Satisfactory progress in completing arrangements, transport of POPs and other hazardous items to out-of-country and arrival at disposal facility.

Resources Needs (25 – 36 MAPSD):

Communications ..... included in NG POPs Coordinator Budget

Resources Needs (37 – 48 MAPSD):

Communications ..... included in NG POPs Coordinator Budget
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Cost of POPs and other hazardous substances transport from storage facility to dock (estimated avg. of $2,000/state x 4).....$8,000
Freight costs – shipping of four containers FSM to Pacific Rim location (estimated at $8,000/state) $32,000

Objective #4 Total.....$40,000

Objective #5 – To, by 48 MAPSD, rehabilitate or otherwise eliminate any possibility of being a source of toxic exposure, all known and as many as possible of the yet-to-be discovered, contaminated sites in the country.

List of Activities/Time Frame/Responsible Parties:

5.1 Procure, if needed in addition to items obtained during Activity 1.4, testing kits, protective gear, and other necessary tools and equipment. (31-36 MAPSD – Staff of each state Environmental Protection Office identifying needs, procurement arrangements coordinated by National Government POPs Program Coordinator)

5.2 Public Service Announcements (seeking assistance from the general public with the identification of as yet undiscovered sites) created, translated, and broadcast; information further disseminated by NGO efforts; system developed in each state to record and add responses to the "potential suspected contaminated sites" list (31-36 MAPSD – Staff of each state Environmental Protection Office)

5.3 Conduct an analysis of all suspected contaminated sites in the FSM using the information collected during Activities 1.1, 1.2, and 5.2 to determine the type of decontamination process that will be needed at each site. (37 - 42 MAPSD – Select staff of each state Environmental Protection Office and short term consultant who will provide state level training workshops on this topic)

5.4 Utilize overseas laboratories to provide analytical services as necessary. (37 - 42 MAPSD - National Government POPs Program Coordinator)

5.5 Remove, if necessary, any remaining POPs or other hazardous substances, and decontaminate the site by removing or neutralizing contaminated soils and other materials. (37-45 MAPSD - Select staff of each state Environmental Protection Office)

5.6 Secure by perimeter fencing and posting, any site which cannot be restored to prevent any possibility of further environmental or human exposure episodes. (43-48 MAPSD - Staff of each state Environmental Protection Office)

Performance Indicator(s): Satisfactory progress in procuring needed testing gear and materials, broadcasting Public Service Announcements, analysis of all identified contaminated sites, laboratory testing as necessary, removal of any remaining hazardous materials and transport to storage, decontaminating or securing sites as necessary.

Resources Needs (25 – 36 MAPSD):

State POPs Program/EPA Office remuneration	in State Cross-Project Budget
Testing equipment, protective gear	$12,000
Public Service Announcements – printing & reproduction	4,000
Public Service Announcement broadcast fees	2,000
Total	$18,000

Resources Needs (37 – 48 MAPSD):

State POPs Program/EPA Office remuneration	in State Cross-Project Budget
Consultant (1.5 months)	$24,000
Travel – NG POPS Coordinator and Consultant - Kosrae, Chuuk, Yap	12,000
State Training workshop for state EPA staff (est. avg. $2000 / state)	8,000

Laboratory contracts 10,000
Samples Packaging/shipping costs (est. avg. $2000 / state) 8,000
Local travel (land and sea, est. avg. $5,000 / state) 20,000
Contaminated Materials Removal and transport (est. avg. $20,000 / state) 80,000
Fencing material and installation (est. avg. $10,000 / state).....40,000

Total $202,000

Objective #5 Total.....$220,000

Objective #6 - To establish, by 48 MAPSD, a system that will 1) monitor contaminated sites until no longer necessary, and 2) facilitate the identification of any overlooked or recently created identified contaminated sites.

List of Activities/Time Frame/Responsible Parties:

6.1 Procure long-term monitoring equipment as required by each state. (43-48 MAPSD – Staff of each state Environmental Protection Office identifying needs, procurement arrangements coordinated by National Government POPs Program Coordinator)

6.2 Continuously monitor on an appropriate timetable, subsequent to completion of restoration, all sites until the time when an area can be certified to be absolutely safe. (43 MAPSD and on-going - Staff of each state Environmental Protection Office)

6.3 Conduct workshop for health care providers to develop Public Health "warning" protocols to be utilized in order to help identify pollution source sites from information such as patient symptoms and medical statistics. (by 48 MAPSD – National Government POPs Program Coordinator and short term consultant who will conduct training workshop)

Performance Indicator(s): Equipment procured, establishment of monitoring efforts, and "warning" protocol developed at workshop, and in use by health care providers.

Resources Needs (37 – 48 MAPSD0:

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Monitoring equipment (avg. $5,000/state).....$20,000
Consultant (0.5 month) 8,000
National Training Workshop (Health Services staff - 2/state – 1 week) 12,000
National Training Workshop expenses.....2,000

Objective #6 Total.....$42,000

Action Plan #2 - Total Budget $860,000

4.3.3 Action Plan #3 - Phasing Out Existing PCBs and Disposal

Context and Analysis of the Issue:

In the Federated States of Micronesia, Polychlorinated Biphenyls (PCBs) have been discovered in items of electrical equipment that were brought to the islands and installed in the decades following WWII when the utility infrastructure was constructed in the state centers and then, in subsequent years, expanded into adjacent communities and some outer islands. During this period of infrastructure development, the hazardous properties of PCBs were not yet known. PCBs are employed in industry as heat exchange fluids, in electric transformers and capacitors, in high pressure sodium street lights, as additives in paint, carbonless copy paper, and as an ingredient in sealants and plastics. In the FSM, the electrical equipment containing PCBs are primarily the transformers which are positioned on utility poles and these were used in each of the states. The possibility exists that PCBs may be found in other items in the country, such as the fluorescent light fixtures in older buildings, paints, or plastics.

PCBs are mixtures of chlorinated compounds. PCBs are either oily liquids or solids that are colorless to light yellow, and have no known taste. Some PCBs can exist as a vapor in the air. They are man-made; there are no known natural sources of PCBs. The manufacture of these substances was stopped in the U.S. in 1977, because of the evidence that they build up in the environment and cause health problems. PCBs are very long lasting and can be transported by air currents for long distances. Thus, they are everywhere in the environment, being released from hazardous waste sites, leaks from devices containing PCBs, and from the burning of contaminated items. PCBs bind strongly to soils.

The most common health effects of human exposure to PCBs are skin diseases similar to acne or rash, and possibly liver damage. Many health organizations believe that PCBs are carcinogenic to humans. Women who are exposed to relatively high levels of PCBs may have lower birth-weight babies, and these babies may show abnormal responses in tests of infant behavior. Other health studies indicate the following:

- Reproductive function may be disrupted by exposure to PCBs
- Neurobehavioral and developmental deficits occur in newborns and continue through school-aged children who had in utero exposure to PCBs
- Other systemic effects (e.g., self-reported liver disease and diabetes, and effects on the thyroid and immune systems) are associated with elevated serum levels of PCBs
- Increased cancer risks are associated with PCB exposures.

Personnel in each of the four states now have the capacity to do screening tests for PCB's in transformers, as test kits are available and the associated training on use of the kits has been conducted. However, the necessary tools, full protective gear, and test kits must to be determined and procured.

The current situation is that almost all of the PCB containing transformer units have been identified and removed from service. These have been collected at one main location on each island, and many of them were removed from the country in June 2006. Technical assistance was provided by SPREP and AusAID to complete this removal effort. However, in some states, further testing is necessary to ascertain if <u>all</u> PCB containing transformers have been identified.

Also, due to the lack of replacement transformers in some locations, not all of the units identified as containing PCB's have been removed from service, but will be as the replacements become available. It is not possible to remove this "in-use" equipment without causing disruption to essential power services. The entities which are responsible for the generation and distribution of electrical power in each of the four FSM states are working cooperatively with the state POP's Task Forces to complete this work.

One of the locations known to still have PCB contamination is the former LORAN Station in Yap state. Further investigation is needed to determine the extent of the contamination and the threat that is posed. The locations of remaining transformers/capacitors that need further evaluation include in Kosrae State, and on the Yap outer island of Woleiai. The location of one transformer earlier identified as potentially contaminated in Chuuk state is now uncertain, so additional investigation is needed.

Goals And Objectives

The overall goal for this action plan is the complete removal of all PCB's from the Federated States of Micronesia. There are five main objectives to be met to reach this goal.

1. To complete, by 24 MAPSD, a comprehensive inventory of any remaining PCB's in the country.

Objectives #2 through #5 are completed under Action Plan #2, and the resources to support the activities are included in the AP#2 budget. PCB will be collected at the same time as the items targeted in AP#2.

2. To construct, by 24 MAPSD, an appropriate storage facility for PCB's containing items in each FSM state.
3. To collect and transport, by 36 MAPSD, all identified PCB containing items to the storage facilities and prepare them for off-island disposal.
4. To export, by 48 MAPSD, all collected PCB containing items from each state's storage facility to an out-of-country disposal facility.
5. To complete, by 48 MAPSD, a final clean-up of any remaining PCB contaminated sites.

Relevant Management Options

This project, targeting the phase out the remaining PCB containing transformers and other PCB containing items in the FSM, is a straightforward effort with few alternatives to be considered. Possible options would include hiring a consultant, adjusting the schedule of activities, increasing the number of storage facilities, and utilizing private sector expertise to conduct the collection and transport of PCB containing items to the storage facilities.

The work necessary to complete this action plan is nearly identical to that necessary for Action Plan #2, dealing with hazardous substances and contaminated sites. The main difference is in identifying any remaining PCB containing equipment or tother items in the nation. For this work it may be necessary to secure a consultant to assist in the identification unless the four state EPA

(or equivalent) offices now have the capacity to complete this task. Another option would be to conduct a national training workshop on the identification of potential PCB containing items. A similar situation exist with regard to the identification of contaminated sites, however the training provided to local staff during the recent removal of PCBs and other hazardous substances has improved the FSM's capacity in this area.

Criteria For Evaluation And Prioritization Of Options

A consultant with expertise in the area of PCB's may be needed to assist the FSM Environmental Health Unit and the four state EPA offices (or equivalent) with identifying what kind of items, other than the known PCB containing transformers, may contain PCB's. This information will be used to create a list of items that may be present in the country, for which to search. It is also possible that current local expertise can complete this task.

The scheduling of the activities for this project may be accelerated if objectives are completed ahead of the timeline as suggested above, and funds are available to move onto the next step. The identification and collection of all PCB containing items at the storage facilities should be completed as soon as possible, so as to minimize human and environmental exposures. Once these items are in storage, the schedule of remaining activities can be accelerated or slowed as determined by resource availability. However, the storage facilities must be monitored to prevent any possible containment problems, and arrangements for removal to off-island disposal facilities should be completed without undue delay.

The number of storage facilities depends on the amount of PCB containing items that are identified and their location. It is anticipated that most of these items will be located in the state centers, however some PCB containing items may be found on other islands where electric power is generated and/or older buildings still stand. The cost and danger of transporting these items must be balanced against the cost of an additional storage facility and the ability of the ship, which will eventually remove the items for out-of-country disposal, to collect the items at each location. Provided that the PCB containing items can be safely packaged, it is envisioned that the state field trip ships will be able to transport the items to the storage facilities in the state centers.

Depending on the results of the surveys to identify all of the remaining PCB containing items in the country, it may be more cost effective to secure the services of out-of-country expertise to collect and transport the identified items. The capacity of local expertise and the availability of necessary transport and protective equipment will need to be assessed and the cost to complete the necessary work calculated. The terms of reference identified for this calculation can then be utilized to develop a request for proposals for external expertise. Careful cost comparisons would then identify the most cost-efficient option. Safety concerns must also be considered.
In that many of the items that might contain PCB's may have been used in construction completed during the Trust Territory times, it is possible that US assistance with the removal of items containing PCBs and the clean-up of contaminated sites may be available.

Action Plan Implementation Strategy

The coordination of this PCB's phase out and disposal project will involve the FSM National Government's Environmental Unit at HESA, the four state EPA (or equivalent) offices and, for activities involving PCB containing transformers, the entities which are responsible for the generation and distribution of electrical power. A consultant with knowledge regarding items that may contain PCB's may be necessary.

The FSM Environmental Unit will be responsible for securing the technical assistance necessary to support each state to complete the comprehensive inventory of any remaining PCB's and also for the arrangements necessary for the transport of PCB containing items out of the country for final disposal at an appropriate facility. Coordination with the state level will be needed for the successful execution of these tasks.

The responsibilities of the four state Environmental Protection Offices (or equivalent) will include the actual state-wide survey to identify any remaining PCB containing items (in conjunction with the technical support provided by the NG), the construction of storage facilities, the collection of all PCB containing items at the storage facilities, and the proper packaging of these items for removal. States will also need to conduct the final clean-up activities as needed.

The entities which provide the generation and distribution of electrical power in each state will be required to remove any remaining PCB containing transformer units from service by detaching such units from the utility poles. A collaborative effort with the state Environmental Protection Offices (or equivalent) will then be needed to safely remove the PCB's from the transformer units and transport to the storage facility.

All PCB containing transformers which remain in service must be located in areas where the possibility of human exposure or release into the environment is minimized to the fullest extent. If necessary and until replacement transformer units are available, it may be required that PCB containing transformers be switched with non-PCB containing units to remove the hazardous units from proximity to local populations. This work must be done as soon as possible after identification, and should be completed within two years following the start of the PCB phase out and disposal project. During this two year period, each PCB containing transformer must be monitored on an on-going basis, following a schedule developed by the state Environmental Protection Offices (or equivalent). PCB level monitoring reports shall also be submitted to these offices until the unit is removed from service.

The legal framework to support all of the above will be completed in the accompanying Action Plan (#1) dealing with the legal aspects of chemical management. When completed, the legal framework must prohibit the import of any PCB containing item and require that any PCB containing item which is discovered in the FSM must be reported to the appropriate authority, either the state EPA (or equivalent) office or the police (as focal point for the hazmat team).

Much of the effort needed under this action plan to address the PCB issue duplicates the activities listed under the previous action plan to address hazardous waste storage, disposal and contaminated site clean-up (Action Plan #2). Thus, many of the efforts listed in Action Plan #2 can be expanded to address the need of PCB Action Plan (#3). Therefore, the resources

identified in this Action Plan target activities specific to detecting all remaining PCBs in the country. Every island in the FSM should be measurably free from PCB contamination.

The work plan containing each of the numbered objectives above is as follows.

Objective #1 – To complete, by 24 MAPSD, comprehensive inventory of any remaining PCB's in the country.

List of Activities/Time Frame/Responsible Parties:

1.1 Create list all potential items in the FSM that may contain PCB's. (by 6 MAPSD - NG Pop's Program Coordinator, Short term PCB consultant)

1.2 Public Service Announcements (seeking assistance from the general public with the identification of any potential PCB containing item) created, translated, and broadcast; information further disseminated by NGO efforts (by 9 MAPSD – Staff of each state Environmental Protection Office)

1.3 Develop System in each state to record and add responses to the "potential suspected contaminated sites" list (by 9 MAPSD – Staff of each state Environmental Protection Office)

1.4 Physically locate items identified on the list and classify as "non PCB" or a "PCB containing article" by item identification or test for PCB's and complete log description of each PCB containing item and exact location. (by 24 MAPSD – Staff of each state Environmental Protection Office)

Performance Indicator(s): Satisfactory progress in identification of PCB containing items as evidenced by creation of Announcements, "Potentials List" and "Identification/Location Log"

Resources Needs (1 – 12 MAPSD):

Consultant (0.5 month)	$8,000
State POPs Program/EPA Office remuneration	in State Cross-Project Budget
Public Service Announcements – printing & reproduction ($1000 / state)	4,000
Public Service Announcement broadcast fees ($500 / state)	2,000
Total	$14,000

Resources Needs (13 – 24 MAPSD):

State POPs Program/EPA Office remuneration	in State Cross-Project Budget
Record keeping supplies (average $1,000 per state)	4,000
Intra-state local travel (land and sea, average $5,000 per state)	20,000
Total	$24,000

Action Plan #3 - Total Budget $38,000

4.3.4 Action Plan #4 - Public Education and Awareness Concerning the FSM National POPs Situation and the Need to Reduce Dioxin and Furan Production

Context and Analysis of the Issue:

In the Federated States of Micronesia, one of the top priority concerns in the area of safe chemical management is the lack of understanding and awareness among the general populace pertaining to the serious and potentially impending crisis nature of the local situation regarding the presence, and the probability of continued importation and production of hazardous substances, including persistent organic pollutants (POPs). The unintentional, in-country production of two specific POPs, dioxins and furans, is of particular concern as it is the result of specific "innocent" behaviours which are practiced by many residents on a regular and frequent basis. The term "innocent" is used with reference to the fact that the vast majority of FSM residents who are involved with operating vehicles and other fossil fuel burning engines, and the burning of trash and other rubbish are not aware of the hazardous chemicals being released by the combustion process and the possible harmful exposure to family members, neighbours, and other people living in the vicinity or downwind. In comparison to the other ten POPs substances, dioxins and furans constitute the most serious overall, public health threat to populations in the FSM. Exposure to the harmful effect of pesticides and PCBs is generally more limited with regard to the number of persons who come into contact with these POPs.

This lack of awareness presents a significant obstacle to effective concerted action to address the situation at the community, state, national, and international levels. Without such action, the country remains very susceptible to the public health and environmental problems caused by these toxic substances. Human morbidity and mortality due to direct exposure to toxic materials, and indirect exposure by consumption of contaminated food stuffs and/or water, or breathing polluted air, can place a considerable added, but cause un-associated, burden on the nation's health systems. Due to the persistent nature of these substances to remain in the environment and in animal tissue for long periods of time, and the very minute amounts often involved, it is typically impossible to identify a cause and effect relationship between the exposure to a toxic substance and an individual's poor health outcome connected to that exposure. At the same time, the potential for contamination of off-shore oceans, reef and coastal marine environments, inland waterways and streams, soils, and the air, by hazardous substances, including POPs, could result in food shortages and lead to possible economic ruin for important sectors of the local economy, including agricultural, fisheries (and other marine commodities), and tourism.

The FSM has been fortunate because no major, large scale health or environmental disasters caused by POPs or other dangerous chemicals have occurred in the country. Tragic disasters that have occurred in other countries, disasters which were caused by hazardous materials (including POPs), radioactive materials, or buried toxic substances, have served to create a more universal consciousness among the affected populations, sensitizing residents to these important health and environmental issues. The publicity surrounding these unfortunate events has increased the number of people who have concerns about POPs and other hazardous substances, which in turn, increases public influence on both government decisions and social behaviors. The FSM, without such incidents and with limited media resources, faces the challenge of making the general public aware of the potential risks posed by the use and disposal of POPs and other

hazardous substances. Given the relatively fragile nature of the small island environments and the critical dependence of populations on these environments for food and livelihoods, the government must not wait for a major catastrophe before undertaking a wide-ranging awareness building effort.

The POPs project has begun the awareness building effort, with initial efforts underway in each state, with the FSM-HESA providing resources and technical assistance. The strategy has been to follow a similar course of action as employed in other programs to propagate information to the public: community meetings, theme day programs, presentations at schools, and some limited media exposure. However, these campaigns are usually somewhat limited in scope, and are not, as yet, the long-term endeavours that must be undertaken to get sufficient information broadly dispersed so as to create a more wide-spread understanding and awareness in large segments of the population. These existing approaches must be up-scaled and expanded to include additions to the school curriculum, more frequent community intervention activities, and greater mass media publicity. Certain POPs creating activities, which are seen as harmless by most individuals, must be targeted for special attention. In addition to the general public, specific vulnerable groups must be targeted to receive special information that is particularly relevant to their situations. For example, residents living near known sources of pollution should realize that they do have recourse to seek corrective actions, and that national and state laws should exist to protect them and assist them to access necessary medical services.

Legal support in this endeavor is an essential need. The disposition of violators must adequately reflect the seriousness of the matter in order to be a means of deterrence, and to reinforce proper attitudes and behaviors. The EPA offices often are discouraged by that fact that violators of environmental laws and regulation are seldom prosecuted, and rarely is such legal action successful. Law enforcement and legislative endorsement are one of the important vehicles to facilitate progress in the effective management of POPs and other hazardous substances. An accompanying FSM POPs Action Plan (#1) concentrates on the development of the legal framework to address POPs and hazardous waste issues.

For populations living on the islands of the FSM, potential exposure to dioxins and furans are the result of emissions from five main sources:

- Smoke from the residential burning of rubbish in open fires,
- Exhaust from cars, trucks, motorcycles, outboard engines, etc.,
- Smoke from the burning of solid waste at dumpsites,
- Exhaust from fossil-fuel powered electricity generating plants and other similarly powered facilities, and
- Smoke from cooking fires.

In addition to awareness campaigns, there is a need to develop and enforce laws and regulations that will serve to reduce the emission levels from these sources. Practices and behaviours which for many years have been considered harmless must be discouraged by public attitude and restrictive laws. By adopting priorities that will encourage a switch from fossil fuels to alternative sources of energy, eventually a significant near elimination of in-country production of dioxins and furans is possible.

The management of solid waste disposal is presently not regulated and there are no updated national criteria in place to provide a framework for this control. Likewise emission measurement and control from power generating facilities is non-existent. External expertise will be needed to assist the local state and national governments to address both of these matters. The NHSEWG will be responsible for developing the Terms of Reference for the consultants needed to assist with these issues.

The present POPs Task Forces existing in each state are not large groups, were created as a result of Executive Orders declared by the governors of each state, and are composed primarily of individuals with other full time positions in the government. These groups may be sufficient to perhaps organize and even get the initial public awareness activities implemented and operating for a short period. However, it will take a long-term commitment of personnel and resources to develop a comprehensive, sustained awareness program operating at the intensity necessary to achieve proper changes in the general public's attitudes and concerns about POPs and other hazardous substances.

Goals And Objectives

The overall goal for this action plan is to increase the awareness of the general public in the Federated States of Micronesia about the health and environmental risks posed by POPs and other hazardous substances. The dangers posed by dioxins and furans are to receive special attention in this effort.

The creation and on-going support for the FSM's National Hazardous Substance Expert Working Group (NHSEWG) is included in overall Action Plan implementation strategy. The NHSEWG will serve as a source of the available in-country expertise and will facilitate the provision of relevant and accurate information to the nation's leadership regarding the development of legislation addressing all aspects of POPs and other hazardous substances management, including the development of the public education and awareness program, including specific actions to reduce dioxin and furan emissions.

There are nine specific objectives listed in this Action Plan #4 to reach this goal.

1. To establish, at the NHSEWG organizational meeting (by 6 MAPSD), within the NHSEWG, a standing committee to coordinate awareness program activities.called the "National Hazardous Substance Awareness Program Working Group" (NHSAPWG), consisting of representatives from appropriate state and national level government offices (including the Departments of Education, Health, and Public Information), the private sector, and representatives from non-government organizations.
2. To designate, by 7 MAPSD, a "State POPs Public Awareness Program Manager" in each state.
3. To develop, by 12 MAPSD, a collection of accurate, up-to-date POPs information to be utilized as a basis to create the awareness messages included in the various formats listed in objectives #4, #5 and #6 below, and as a foundation for the "POPs Clearinghouse" database (Objective #7).

4. To publish, beginning 12 MAPSD, and on-going thereafter, a POPs newsletter (printed and electronic) on a quarterly basis, in each FSM state.
5. To produce, beginning 12 MAPSD, POPs and other hazardous substances information releases, utilizing a variety of mass media methods (fliers, brochures, posters, newspapers, television, and radio) and averaging two releases per quarter.
6. To develop by 12 MAPSD, programs to utilize World Environmental Day, and other similar theme days, to promote POPs awareness; and by 24 MAPSD, to have conducted in each state a series of four (4) different community presentations/workshops per year, describing the POPs issue, and the public's role in addressing the problems associated with POPs and other hazardous substances. Venues for these presentations/workshops should include all main village and any other location that is particularly POPs vulnerable. Repeat during the next two years. Presentations may be shared amongst the states.
7. To establish, by 21 MAPSD, in conjunction with COM-FSM, a nation-wide "POPs Clearinghouse" which can provide accurate information about POPs and other hazardous substances and respond to inquires from the general public. This can be done in conjunction with COM-FSM Environment Clearing House.
8. To develop, by 24 MAPSD a National Solid Waste Policy with the specific aim to reduce in-country production of dioxins and furans. The policy will provide strategies to address and manage emissions from all potential sources. (Information accessed in the drafting of bills in Action Plan #1 will provide a framework for the policy development.)
9. To, by 36 MAPSD, integrate, in 75% of schools nation-wide, a POPs and other hazardous substances awareness curriculum into the nation's school system with grade-appropriate course materials for preschool to grade 12 students; and increase to 90% of all schools by 48 MAPSD.

Relevant Management Options

This project, targeting an increase of awareness about POPs and other hazardous substances among the general public and identified vulnerable groups in the country, can involve a variety of approaches. The objectives listed above will involve a significant amount of effort from those state and national employees tasked with organizing and implementing the various activities. The creation of the NHSAPWG is an option to augment the existing expertise to address these tasks, increase coordination, and provide additional input from the community level. The inclusion of representatives of the private sector and NGOs (such as conservation societies, women's groups, youth groups, faith based organizations, and service clubs) can serve to enhance and extend "coverage", while also permitting vulnerable groups to be represented and to receive appropriate attention.

The national government POPs and Environmental Health Programs and state EPA Offices will be tasked with providing technical assistance to the NHSAPWG. If necessary, consultants will be recruited to assist with development of informational resources for the various mass media channels and the school curriculum materials. Computer/printer systems and publishing software will be needed, as well as Internet connectivity capacity, and the projection equipment necessary to perform presentations to communities and large audiences. Expertise and resources

available from the College of Micronesia – FSM can be accessed to assist with curriculum development, teacher training, and the design and operation of the "POPs Clearinghouse".

Options exist to take advantage of the various existing "theme days" such as Earth Day (22 April), and also to create new "days" to supply occasions to bring together large numbers of people to learn about POPs and other hazardous substances issues. Presentations can take many different approaches: videos can be shown, printed materials can be distributed, and other activities can be utilized to draw crowds. Community "Clean-up Days" present similar opportunities.

The various kinds of POPs and other hazardous substance information that is disseminated to the public must be adapted to the target audiences, and cover a wide range of topics from general information about the types of POPs and other hazardous substances that may be found in the FSM, to particular guidelines on the reduction of dioxin and furan production. Information sharing targeted at specific groups would need specific transfer approaches, such as workshops or on-the-job trainings. Translations into local languages will be necessary for materials to be distributed to any audiences not possessing adequate capacity to understand materials produced in English. Glossaries and concept explanation sheets may be necessary.

Another FSM POPs Action Plan (#1), which is focusing on the establishment of the legislative and legal framework necessary to effectively deal with POPs and other hazardous substances, is under development concurrently with this Public Awareness Action Plan. The NHSEWG will direct this endeavour to ensure that all of the necessary aspects are included and properly coordinated. At the time when regulations limit open residential burning, there will need to be the capacity to enforce such regulations, and acceptable and affordable options available for residents to safely and legally dispose of their rubbish. There will also need to be accurate measurement tools available to determine emission levels from vehicles and power plants. External expertise may be required to assist with establishing specific standards.

Reporting requirements relevant to the project will need to be established. Quantitative measurements would indicate numbers of educational items produced, total distributed, and further details about the distribution process, such as the type of event. Qualitative measurements could be accomplished by baseline and follow-up surveys. School curriculum materials would include evaluations of the effectiveness of the educational programs. Upon the creation, and effective enforcement, of laws and regulations intended to control illegal activities regarding POPs and other hazardous substances, trends in the number and types of citations issued may give an indication of compliance levels, and indirectly, public awareness.

Training of local teachers regarding the instructional activities in the POPs curriculum will be an essential component and training for other community presenters may be necessary as well. The National POPs Program Coordinator and NHSAPWG will work in conjunction with the state and national Departments of Education, and COM-FSM to coordinate and implement these training activities.

To effectively address the issue of in-country dioxin and furan production, it will be necessary to conduct a survey to identify all potential sources of these substances. This will require

professional expertise and measuring equipment not presently available in the FSM. Thus, external expert assistance will need to be recruited. Upon completion of the survey, the consultant selected for this work will be utilized to facilitate a National Workshop aimed at developing a plan to reduce in-country dioxin and furan production, with the creation of a National Solid Waste Management Policy being one of the main components of the reduction effort and a deliverable outcome of the session.

The policy will provide additional groundwork for the enactment of legislation directly regulating dioxin and furan emissions from all sources, and other related activities which will indirectly influence and promote reduced emissions of these substances. These laws would include, but would not be limited to, the following issues:

- The provision of economic incentives to reduce reliance on fossil fuels,
- The establishment of emission standards for all industrial exhausts (including power generating plants), the creation of measurement procedures, and enforcement actions,
- The creation of specific standards of operation for sanitary landfills/dumpsites, and stronger efforts to regulate illegal dumping/littering,
- The establishment of properly operated incinerators in all states,
- A ban on all open fires including domestic rubbish burning and purposely or intentionally set fires for the clearing of land,
- The establishment of emission standards for all vehicles, the creation of measurement procedures, and enforcement actions.

Criteria For Evaluation And Prioritization Of Options

The FSM HESA will be the lead agency for this project, with the National POPs Program Coordinator in collaboration with the State EPA Offices, responsible for coordination and implementation. The NHSAPWG will be in the best position to guide the National POPs Program Coordinator and state EPA staffs on the best alternatives available to complete most of the activities included in this Action Plan. This group will work closely with the state and national environmental offices and POPs staff.

Decisions to implement specific activities and projects at the state or national level must be determined by careful consideration of the cost-effectiveness and the focus of the effort. National level responsibilities will need to address coordination, information management and sharing, and arranging external contacts for consultants or other specialized technical assistance. State level tasks would involve presentation design and performance, production of mass media items, and interface systems to provide and collect information to and from the local general public.

If current local experts available in the Departments of Education determine that additional assistance is needed to complete the varied tasks involved with this work plan, a consultant with expertise in the area of curriculum development may be necessary. Consultants involved with other work plans may also be able to assist here.

Action Plan Implementation Strategy

The National POPs Program Coordinator and the NHSAPWG, during their coordinating meetings, will direct and monitor the activities scheduled for this Public Awareness project. The scheduling of the activities for this project may be accelerated if objectives are completed ahead of the suggested timeline, and if funds are available, to move on to the next step.

The basic approach for this project is to first establish a coordinating group (the NHSAPWG) within the NHSEWG and with members representing a wide range of the various stakeholders in the FSM society, and then proceed to develop and implement a number of activities, including the utilization of mass media resources, which will bring the POPs and other hazardous substances awareness messages to the public in general. More targeted activities can be directed at children in school or specific vulnerable populations. Some of the materials will be designed to deliver the messages particularly to the different levels of political leadership, and also to traditional leaders. Since each day that passes brings the FSM's potential POPs and/or other hazardous tragic disaster closer, it is important to begin the awareness effort as soon as possible. To this end, the early media releases and newsletters may be general, or introductory, in nature, perhaps relatively simple and short, but emphasizing certain compelling and urgent aspects of the issue, such as the necessity for prompt action on the part of the political leaders in developing enabling legislation.

A "clearinghouse" scheme will be established to permit a flow of information both to and from the general public. It will be a source of accurate, up-to-date facts about POPs and other hazardous substances, and will provide information about the situation in the FSM. It will also serve as a resource to which individuals or groups can report POPs and other hazardous waste related problems and issues.

The work plan containing each of the numbered objectives above is as follows.

Objective #1 - To establish, at the NHSEWG organizational meeting (6 MAPSD), within the NHSEWG, a standing committee to coordinate awareness program activities, called the "National Hazardous Substance Awareness Program Working Group" (NHSAPWG), consisting of representatives from appropriate state and national level government offices (including the Departments of Education, Health, and Public Information), the private sector, and representatives from non-government organizations.

List of Activities/Time Frame/Responsible Parties:

1.1 Develop draft Terms of Reference for the NHSAPWG membership, considering balanced state representation, members from the state and national Departments of Education, and representation from civil society (NGOs) and the private sector. (by 3 MAPSD - NG POPs Program Coordinator and POPs NCC)

1.2 Organize and convene NHSAPWG sessions in conjunction with scheduled NHSEWG working meetings for the following three years of the project. (for 24, 36, and 48 MAPSD - NHSEWG and National Government Pop's Program Coordinator)

Performance Indicator(s): Satisfactory progress, as per schedule, to draft Terms of Reference, formalize NHSAPWG as a standing committee in the NHSEWG, and meetings conducted.

Resources Needs (1 – 12 MAPSD):
Communications ..... NG POPs Program Coordinator Budget

Resources Needs (13 – 24 MAPSD):
Communications ..... NG POPs Program Coordinator Budget
State POPs Public Awareness Program Manager to NHSAPWG meeting $4,000

Resources Needs (25 – 36 MAPSD):
Communications ..... NG POPs Program Coordinator Budget
State POPs Public Awareness Program Manager to NHSAPWG meeting $4,000

Resources Needs (37 – 42 MAPSD):
Communications ..... NG POPs Program Coordinator Budget
State POPs Public Awareness Program Manager to NHSAPWG meeting $4,000

Objective # 1 Total.....$12,000

The other resources needed to support State POPs Public Awareness Program Manager to NHSEWG/NHSAPWG joint meetings are included in the overall budget of the NHSEWG.

Objective #2 – To designate, by 7 MAPSD, a "State POPs Public Awareness Program Manager" in each state.

2.1 Identify the "State POPs Public Awareness Program Manager", the individual in each state who will be responsible for developing, organizing, coordinating and implementing the various activities of the POPs Awareness Program (by 7 MAPSD – State EPA Offices select staff, National Government POPs Program Coordinator develop selection criteria in consultation with NHSEWG and NHSAPWG)

Performance Indicator(s): Satisfactory progress, as per schedule, in identifying qualified individual to fill the position in each state.

Resources Needs (1 - 12 MAPSD):
Communications ..... NG POPs Program Coordinator Budget
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget

Objective #3 - To develop, by 12 MAPSD, a collection of accurate, up-to-date POPs information topics to be utilized as a basis to create the awareness messages to be included in the various

formats listed in objectives #4, #5 and #6 below, and as foundation material for the "POPs Clearinghouse" database (Objective #7).

List of Activities/Time Frame/Responsible Parties:

3.1 Compile list of reference materials as sources of accurate and current POPs information. (7 – 8 MAPSD - NG POPs Program Coordinator and State POPs Public Awareness Program Manager, in consultation with NHSAPWG)
3.2 Create lists of potential topics to be used in Awareness Program. Special attention to be given to reduction of in-country production of dioxins and furans. (9 - 10 MAPSD – NG POPs Program Coordinator and State POPs Public Awareness Program Manager)
3.3 Conduct national level workshop to develop materials to be utilized in Awareness Program activities identified in Objectives #4, #5, and #6. (by 12 MAPSD - NG POPs Program Coordinator and State POPs Public Awareness Program Manager, Consultant to facilitate)

Performance Indicator(s): Satisfactory progress, as per schedule, in identifying staff, creating resource and topics lists, conducting workshop.

Resources Needs (1-12 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Consultant (0.5 months).....$8,000
National Awareness Program Materials Development Workshop
(state EPA staff - 3/state – 1 week).....16,000
Supplies for workshop 5,000

Objective # 3 Total.....$29,000

Objective #4 - To publish, beginning by 12 MAPSD, and on-going thereafter, a POPs newsletter (printed and electronic) on a quarterly basis, in each FSM state.

List of Activities/Time Frame/Responsible Parties:

4.1 Identify the "State POPs Newsletter Publisher," the individual in each state who will be responsible for newsletter (by 7 MAPSD – State EPA Offices select staff, National Government POPs Program Coordinator develop selection criteria in consultation with NHSAPWG). It is anticipated that the State POPs Public Awareness Program Manager will fill this position, however state EPA Offices may decide to have more than one individual working on the POPs Public Awareness program activities.
4.2 Identify and procure needed computer equipment (computer, scanner, printer, camera), publishing software, and related supplies for each state (by 8 MAPSD, - National Government POPs Program Coordinator, in consultation with State EPA Offices)
4.3 Develop newsletter electronic and hard-copy distribution list - include all municipal, state, and national level leaders, all schools, NGO's, and other interested parties, copies to be available to the general public and select articles to be included in local newspapers when possible (by 8 MAPSD – State EPA Offices, in consultation with NHSAPWG)

4.4 Collect information and photos, compose articles, design layout, distribute electronic copies, print and distribute hard-copies (by 12 MAPSD – State POPs Newsletter Publisher in each state, content/editorial advice to be provided by State EPA Offices and the NHSAPWG) The first issue, given the short preparation time may be a smaller, introductory issue

4.5 Subsequent issues published in both formats per quarterly schedule, these would be longer and broader in scope than the first issue (on-going, second issue published by 15 MAPSD until 48 MAPSD – State POPs Newsletter Publisher in each state, content/editorial advice to be provided by State EPA Offices and the NHSAPWG.

Performance Indicator(s): Satisfactory (as scheduled) progress in identifying state level individuals for POPs Newsletter Publisher position, procurement of computer equipment and related supplies, distribution list created, first and subsequent issues produced, in hard copy and electronic, on a quarterly basis

Resources Needs (1 – 12 MAPSD):

Computer and related equipment & software (avg. $5,000/state) $20,000
Printing supplies (avg. $500/state x 1 quarter) 2,000
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget

Resources Needs (13 – 24 MAPSD):

Printing supplies (avg. $500/state x 4 quarters).....$8,000
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget

Resources Needs (25 – 36 MAPSD):

Printing supplies (avg. $500/state x 4 quarters).....$8,000
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget

Resources Needs (37 – 48 MAPSD):

Printing supplies (avg. $500/state x 4 quarters).....$8,000
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget

Objective #4 Total.....$46,000

Objective #5 - To produce, beginning by 12 MAPSD, POPs and other hazardous substances information releases, utilizing a variety of mass media methods (fliers, brochures, posters, newspapers, television, and radio) and averaging two releases per quarter.

List of Activities/Time Frame/Responsible Parties:

5.1 Identify the "State POPs Mass Media Development Officer," the individual in each state who will be responsible for newsletter (by 7 MAPSD – State EPA Offices select staff, National Government POPs Program Coordinator develop selection criteria in consultation with NHSAPWG) It is anticipated that the State POPs Public Awareness Program Manager will fill this position, however state EPA Offices may decide to have more than one individual working on the POPs Public Awareness program activities.

5.2 Develop listing of mass media methods to be utilized and identify resources/technical assistance needed for each method (by 8 MAPSD, - State POPs Mass Media Development Officer)

5.3 Identify and procure needed equipment (computer, scanner, printer, camera, software, etc.) and related supplies for each state (by 8 MAPSD, – State POPs Mass Media Development Officer, State EPA Offices, and National Government POPs Program Coordinator) Most of the equipment to be used is already procured in Objective #4.2.

5.4 Collect information and develop 'topic list' for the first year's eight releases, including information on which method will be used for each topic (by 11 MAPSD, – State POPs Mass Media Development Officer in each state, content/editorial advice to be provided by State EPA Offices and the NHSAPWG)

5.5 Develop work plan and schedule to be followed to coordinate the creation of the releases and the topics to be covered by each mass media method, secure contracts for out-sourcing of specialized methods (videos and/or radio broadcasts as necessary), topics should follow logical sequence and schedule of methods should be varied (by 12 MAPSD – State POPs Mass Media Development Officer in each state, advice to be provided by State EPA Offices and the NHSAPWG)

5.6 Complete production of the first two releases and begin distribution or broadcast as appropriate to each topic's method (by 14 MAPSD - State POPs Mass Media Development Officer in each state, content/editorial advice to be provided by State EPA Offices and the NHSAPWG)

5.7 Continue production and distribution or broadcast as appropriate, of the remaining six releases (from 15 – 24 MAPSD - State POPs Mass Media Development Officer in each state, content/editorial advice to be provided by State EPA Offices and the NHSAPWG.

5.8 Continue production and distribution or broadcast as appropriate, of eight releases per year for the next two years (from 25 – 48 MAPSD - State POPs Mass Media Development Officer in each state, content/editorial advice to be provided by State EPA Offices and the NHSAPWG.

Performance Indicator(s): Satisfactory (as scheduled) progress in identifying state level individuals for State POPs Mass Media Development Officer position, procurement of equipment and related supplies/resources needed, 'topic' lists created, work plan and schedule created, complete creation of first two and remaining six releases, continued eight releases in each of next two years.

Resources Needs (1 – 12 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Computer and related equipment not procured above(avg. $3,000/state) $12,000
Contracts: video & radio productions (avg. $10,000/state) $40,000

Resources Needs (13 – 24 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Printing supplies & broadcast fees (avg. $1,500 and $500 per state) $8,000
Contracts: video & radio productions (avg. $10,000/state) $40,000

Resources Needs (25 – 36 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Printing supplies & broadcast fees (avg. $1,500 and $500 per state).....$8,000

Resources Needs (37 – 48 MAPSD):
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Printing supplies & broadcast fees (avg. $1,500 and $500 per state).....$8,000

Objective #5 Total.....$116,000

Objective #6 - To develop by 12 MAPSD, programs to utilize World Environmental Day, and other similar theme days, to promote POPs awareness; and by 24 MAPSD, to have conducted in each state a series of four different community presentations/workshops per year, describing the POPs issue, and the public's role in addressing the problems associated with POPs and other hazardous substances. Venues for these presentations/workshops should include all main village and any other location that is particularly POPs vulnerable. Repeat during the next two years. Presentations may be shared amongst the states.

List of Activities/Time Frame/Responsible Parties:

6.1 Identify the "State POPs Information Officer" the individual in each state who will be responsible for organizing Theme Day presentations (by 7 MAPSD – State EPA Offices select staff, National Government POPs Program Coordinator develop selection criteria in consultation with NHSAPWG) It is anticipated that the State POPs Public Awareness Program Manager will fill this position, however state EPA Offices may decide to have more than one individual working on the POPs Public Awareness Program activities.

6.2 Identify and procure needed computer equipment (computer, scanner, printer, camera, LCD Projectors), publishing software, and related supplies for each state (by 8 MAPSD - POPs Information Officer, NG POPs Program Coordinator, in consultation with State EPA Offices)

6.3 Develop "Theme Day" calendar of events, include all municipal, state, and national level dates of events that present opportunities for sharing information, identify three per state (by 9 MAPSD – State POPs Information Officer, in consultation with NHSAPWG and NG POPs Program Coordinator)

6.4 Collect information, photos, graphics, etc. and four presentations appropriate for community meetings, Completed presentations will be shared among states. (by 12 MAPSD – State POPs Information Officer in each state and NHSAPWG)

6.5 Perform four prepared presentations in each state per year. (first presentation by 15 MAPSD and then on-going for next two years – State POPs Information Officer and EPA staff)

Performance Indicator(s): Satisfactory (as scheduled) progress in identifying state level individuals for POPs Information Officer position, procurement of computer equipment and related supplies, lists and calendar created, presentations designed and performed

Resources Needs (1 – 12 MAPSD):
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget

LCD Projector for PowerPoint software, portable computer system camera presentation furniture ($5,000/state) $20,000
Presentation design and materials ($3,000/state) 12,000

Total $32,000

Resources Needs (13 – 24 MAPSD):
State POPs Program/EPA Office remuneration ..... in State Cross-Project Budget
Presentation supplies ($1,500/state) $6,000
Local transportation to presentation venues (est. avg. $2,000/state) 8,000

Total $14,000

Resources Needs (25 – 36 MAPSD):
State POPs Program/EPA Office remuneration ..... in State Cross-Project Budget
Presentation supplies ($1,500/state) $6,000
Local transportation to presentation venues (est. avg. $2,000/state) 8,000

Total $14,000

Resources Needs (37 – 48 MAPSD):
State POPs Program/EPA Office remuneration ..... in State Cross-Project Budget
Presentation supplies ($1,500/state) $6,000
Local transportation to presentation venues (est. avg. $2,000/state) 8,000

Total $14,000

Objective #6 Total $74,000

Objective #7 - To establish, by 21 MAPSD, in conjunction with COM-FSM, a nation-wide "POPs Clearinghouse" which can provide accurate information about POPs and other hazardous substances and respond to inquires from the general public.

List of Activities/Time Frame/Responsible Parties:

7.1 Identify the "National POPs Information Clearinghouse Officer," the individual in the National POPs office who will be responsible for operating the POPs Clearinghouse (by 7 MAPSD – National Government POPs Program Coordinator select staff, in consultation with NHSAPWG) It is anticipated that the National Government POPs Program Coordinator will fill this position, however the NHSEWG may decide to have more than one individual working on the POPs Public Awareness program activities at the national level.

7.2 Identify the four "State POPs Information Clearinghouse Officers," the individual in each state who will be responsible for facilitating use of the POPs Clearinghouse at the state level (by 7 MAPSD – State EPA Offices select staff, National Government POPs Program Coordinator develop selection criteria in consultation with NHSAPWG) It is

anticipated that the State POPs Public Awareness Program Manager will fill this position, however state EPA Offices may decide to have more than one individual working on the POPs Public Awareness program activities.

7.3 Initiate discussions with COM-FSM on the process of expanding the College's Environment Information Clearinghouse and identify and procure the equipment (computer system, Website and related software, communications time, and related supplies needed to augment the College's system and to ensure accessibility in each state (by 9 MAPSD - POPs Information Clearinghouse Officer, National Government POPs Program Coordinator, in consultation with NHSAPWG)

7.4 In conjunction with COM-FSM, design NHSAPWG clearinghouse operations: 1) Database - containing information relevant to the FSM's POPs situation including all municipal, state, and national level data; 2) Public Interface – a user-friendly system that will facilitate the exchange of information between the general public and POPs information resources; 3) create links to permit easy access to other sources of information; and 4) develop procedures for handling requests for information and reporting formats. (by 12 MAPSD – National Government POPs Program Coordinator, State POPs Information Clearinghouse Officers, in consultation with NHSAPWG; consultant may be contracted for the design work)

7.5 Conduct a national training workshop to train EPA staff on clearinghouse use (by 15 MAPSD – National Government POPs Program Coordinator, State POPs Information Officer in each state, NHSAPWG, consultant)

7.6 Collect and input information as needed to bring the database up-to-date. (by 18 MAPSD – State POPs Information Clearinghouse Officers, National Government POPs Program Coordinator, NHSAPWG)

7.7 Conduct a training workshop in each state to train EPA staff on clearinghouse database use (by 21 MAPSD – POPs Information Clearinghouse Officer, National Government POPs Program Coordinator, in consultation with State EPA Offices and NHSAPWG)

7.8 Open the "POPs Clearinghouse" for general use, and on-going maintenance and updating (open by 24 MAPSD, on-going maintenance and updating continuous during next two years – National and State POPs Information Clearinghouse Officers)

Performance Indicator(s): Satisfactory (as scheduled) progress in identifying national and state level positions, establish agreement with COM-FSM, procurement of computer equipment and related supplies, clearinghouse operations designed and data entry initiated, public interface system developed, national and state level training workshops conducted, clearinghouse fully operational

Resources Needs (1 - 12 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Computer and related equipment & software ($5,000/state & COM-FSM) $25,000
Consultant - Database & Website design (1 month).....16,000

Total $41,000

Resources Needs (13 – 24 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget

National Training Workshop (2/state, 1 week).....$12,000
Consultant – Conduct National Training Workshop $16,000
Travel to conduct State Training Workshops $6,000
State Training Workshops expenses (avg. $2,000 per state) $8,000
Connectivity and computer maintenance costs ($2,000/state & COM-FSM) $10,000

Total $54,000

Resources Needs (25 – 36 MAPSD):
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Connectivity and computer maintenance costs ($2,000/state & COM-FSM) $10,000

Total $10,000

Resources Needs (37 – 48 MAPSD):
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Connectivity and computer maintenance costs ($2,000/state & COM-FSM) $10,000

Total $10,000

Objective #7 Total.....$115,000

Objective #8 - To develop, by 24 MAPSD a National Solid Waste Policy with the specific aim to reduce in-country production of dioxins and furans. The policy will provide strategies to address and manage emissions from all potential sources. (Information accessed in the drafting of bills in Action Plan #1 will provide a framework for the policy development.)

List of Activities/Time Frame/Responsible Parties:

8.1 Identify the "National Solid Waste Management Policy Development Coordinator" and members of the "National Solid Waste Management Policy Development Task Force" (NSWMPDTF), the group will be comprised of representatives of the Environmental Office in FSM Department of HESA, state EPA Offices, other selected members of NHSEWG or NHSAPWG, and representatives of relevant private sector entities and NGOs. The NSWMPDTF will oversee the development of POPs Solid Waste Management Policy (by 9 MAPSD – National Government POPs Program Coordinator in consultation with NHSEWG) It is anticipated that the NG POPs Program Coordinator will fill the National Solid Waste Management Policy Development Coordinator position. However, the NHSEWG may decide to have more than one individual working on the POPs Public Awareness program activities at the national level.

8.2 Develop Terms of Reference, recruit consultant, and conduct survey of current waste management situation in the FSM (by 12 MAPSD – National Solid Waste Management Policy Development Coordinator and consultant)

8.3 Conduct Policy Development Workshop to review survey results and develop National Solid Waste Management Policy, Consultant will facilitate workshop and provide recommendations for consideration by the NSWMPDTF (by 15 MAPSD – National

Solid Waste Management Policy Development Coordinator, NSWMPDTF, and consultant)

8.4 Utilize the National Solid Waste Management Policy to support the establishment of either national and/or state laws, developed in Action Plan #1, which pertaining to the lessening of in-country production of dioxins and furans. (on-going effort by National Solid Waste Management Policy Development Coordinator, NSWMPDTF, state EPA Offices, HESA Environmental Unit) Package of "dioxins and furans" laws to be enacted by 30 MAPSD

Performance Indicator(s): Satisfactory (as scheduled) progress in identifying national level position and NSWMPDTF members, recruitment of consultant, study completed, workshop conducted, National Solid Waste Management Policy adopted, and relevant laws enacted

Resources Needs (1 – 12 MAPSD):

NSWMPDTF support expenses (not covered under the NHSEWG)	$5,000
Consultant – 2 months to Design and Conduct Surveys	32,000
Travel to Conduct State Surveys	$6,000
Total	$43,000

Resources Needs (13 – 24 MAPSD):

NSWMPDTF support expenses (not covered under the NHSEWG)	$5,000
Consultant – 2 months to Complete Survey, Facilitate Workshop	32,000
National Policy Development Workshop (5 days – 2/state)	12,000
National Policy Development Workshop expenses	2,000
Total	$51,000

Resources Needs (25 – 36 MAPSD):

NSWMPDTF support expenses (not covered under the NHSEWG)	$5,000
Total	$5,000

Objective #8 Total $99,000

Objective #9 - To, by 36 MAPSD, integrate, in 75% of schools nation-wide, a POPs and other hazardous substances awareness curriculum into the nation's school system with grade-appropriate course materials for preschool to grade 12 students; and increase to 95% of all schools by 48 MAPSD.

List of Activities/Time Frame/Responsible Parties:

9.1 Identify the "National POPs Curriculum Development Coordinator" and members of the "POPs Curriculum Development Task Force" (POPCDTF), the group comprised of representatives of the national and state Departments of Education and members of the

NHSAPWG, who will oversee the development of POPs curriculum (by 7 MAPSD – National Government POPs Program Coordinator in consultation with NHSAPWG)

9.2 Recruit technical assistance (consultant/curriculum writer, 3 months) for POPs curriculum design (by 9 MAPSD – National Government POPs Curriculum Development Coordinator, in consultation with POPCDTF)

9.3 Conduct POPCDTF National Workshop to develop workplan, and identify/begin procurement of equipment/materials needed for curriculum development (computer system, related software, peripheral equipment) and related supplies (by 12 MAPSD - National Government POPs Curriculum Development Coordinator)

9.4 Develop Draft POPs Curriculum; call and conduct POPCDTF meetings, as necessary, to facilitate successful curriculum development efforts, including publishing or procurement of instructional texts, equipment, and materials (Draft curriculum completed by 18 MAPSD – POPs Curriculum Development Coordinator and POPCDTF)

9.5 Review, pilot testing, and revision of POPs Curriculum (by 24 MAPSD – POPs Curriculum Development Coordinator, POPCDTF, and State Departments of Education)

9.6 Procurement of all instructional texts, equipment, and materials for finalized POPs curriculum (28 MAPSD – POPs Curriculum Development Coordinator and POPCDTF)

9.7 State level Training Workshops to familiarize school teachers with POPs Curriculum (by 30 MAPSD – POPs Curriculum Development Coordinator, POPCDTF, and State Departments of Education)

9.8 POPs Curriculum being taught in 75% of all schools in the FSM by 36 MAPSD, and 90% of all schools in the FSM by 48 MAPSD – (POPs Curriculum Development Coordinator, POPCDTF/NHSAPWG, and State and National Departments of Education)

Performance Indicator(s): Satisfactory (as scheduled) progress in identifying National POPs Curriculum Development Coordinator, POPCDTF members, recruiting technical assistance, procurement of needed curriculum development related equipment and supplies, Completion of draft curriculum, procurement of instructional aids, completion of pilot testing and review process, teacher training, curriculum being taught in percentage of schools nation-wide

Resources Needs (1 – 12 MAPSD):

NG POPs Curriculum Development Coordinator ($25k/yr x 5 months)	$10,500
Curriculum Writing Consultant (3months)	$48,000
Computer system & software	$5,000
Draft Curriculum Development supplies	$20,000
POPCDTF Curriculum Development Workshop (2/state, 1 week)	$12,000
POPCDTF Curriculum Development Workshop expenses	$2,000
Total	$97,500

Resources Needs (13 – 24 NAPSD):

NG POPs Curriculum Development Coordinator	$25,000
Curriculum writing consultant (3months)	48,000
POPCDTF National Workshop support (2 workshops, 2/state, 1 week)	24,000
POPCDTF Curriculum Development Workshop expenses (2 workshops)	$4,000
Instructional materials (for training & pilot testing)	30,000

Pilot Testing of Curriculum - one state.....5,000

Total $136,000

Resources Needs (25 – 36 MAPSD):

NG POPs Curriculum Development Coordinator.....$25,000
Texts & other instructional materials (estimated $10 x 35,000 students).....350,000
Teacher training workshops in states ($2,000/state).....8,000
NG POPs Curriculum Development Coordinator Travel to conduct State Training Workshops.....6,000

Total $389,000

Resources Needs (37 – 48 MAPSD):

NG POPs Curriculum Development Coordinator.....$25,000
Replenishment/additional Instructional materials (avg. $10,000/state).....$40,000

Total $65,000

Objective #9 Total.....$687,500

Action Plan #4 - Total Budget $1,178,500

4.3.5 Action Plan #5 – Pesticide Safety

Context and Analysis of the Issue:

In the Federated States of Micronesia, the demand for dangerous chemicals is relatively small. The largest portion of the demand is for the pesticides that are utilized in agriculture, and the insecticides that are used primarily for general household insects and other pests (often referred to as "structural pest control"). Some potentially dangerous chemicals are also used prior to building construction to rid the proposed construction site ground area of termites, other destructive pests. Plant and structural pests are typically controlled by spraying with properly formulated pesticides, or manually applying these chemicals in powdered or other form. Most of the pesticides have residual effects, while some have direct kill actions.

Pesticides have occasionally been used for Public Health purposes. Following Typhoon Sudal in early 2004, Yap State Government conducted some spraying of pesticides for mosquito control. This one time activity was conducted in accordance with disaster management and EPA standards.

In the FSM, government responsibility for the management of hazardous substances (including pesticides) is shared by the national and state levels. At the FSM National level, the Division of Environmental Health is situated in the Department of Health, Education and Social Affairs, while at the state level the entities responsible for environmental protection are located in the

executive branch, usually under the Office of the Governor. Both levels have responsibilities related to all aspects of chemical management, safe production, since no chemicals are produced in the country. While some legislation to support these efforts exists regarding insecticides and pesticides, these entities have a broader mission that includes protection of the nation's resident population and the environment.

Some of the responsibility for pesticide management is also shared by the state and national agriculture departments. These agencies serve to improve the production of locally grown food stuffs for local consumption and export. The goal of increasing locally grown produce has dual benefits of providing additional nutrition to the diets of residents of the FSM, and also reducing the need to import sometimes expensive and typically less nutritious foods. Agricultural agents assist farmers to improve crop yields and may recommend the use of pesticides, insecticides, and/or fertilizers. These experts are thus involved in all aspects of the life cycle of agricultural chemicals except their production.

One of the FSM national government Office of Trade and Commerce responsibilities is to facilitate the development of markets for FSM products. Since many of these products are in the agricultural sector, the office is concerned that any chemical used by the farmer has to be used correctly, so that no compromise is made adversely affecting the quality of the exported product. The Economic Development Offices at the state level have similar interests.

Chemicals used as pesticides and/or insecticides are available in the FSM due to their importation by either certain government agencies (such as agricultural support programs), or commercial entities. A survey of stores throughout the country revealed that pesticides and other potentially hazardous substances (cleaning solvents, fertilizers, paints, etc.) that contain many different chemicals can be purchased by anyone. Most of these chemicals could be poisonous if misused, but the labels have warnings, and it is assumed to be the responsibility of the consumer to carefully follow the directions for use. A visual examination of the ingredient listings of various products available in hardware stores in each of the FSM states revealed no products that contained POPs, as per the information presented on the labels.

The vast majority of the pesticides and insecticides sold in the retail outlets in the country are imported from the US and have clearly visible warning labels and instructions in English. Some store clerks have the capacity to translate this information into the local languages as necessary. However, as more and more imported items arrive from Asian countries, a concern is that the labelling and warning messages will not be readable by store employees, and thus not easily translatable. All labelling and associated warning labels must be printed in a language that is understandable to the consumer, or at the very minimum an additional step should be included in the distribution process, which would provide written instructions in English, or in the FSM language normally used at the point of distribution.

Nonetheless, the potential for pesticide misuse always exists, and therefore dangerous chemicals must be controlled so that problems of resistance by pests and also inappropriate or excessive use of such substances is prevented. The application of certain 'restricted use pesticides" (as determined by national regulations or state EPA offices) must be properly controlled and supervised, and people who are not instructed about the proper use of <u>any</u> pesticide must, at the

very minimum, be made aware of the dangers of misuse. Even insect sprays that are obtained over-the-counter can be dangerously misused. Contamination of uncovered raw or prepared food is one example of misuse. Misuse by children can be fatal. Consumer and community education is a clear need and it must be focused on proper and safe application: where to use, how to use, how much to use, how to store and dispose, and the dangers that can occur when pesticides and other chemicals are not used correctly.

While the consumer is assumed to be responsible for following the instructions-for-use labelling on items purchased at stores, the responsibility for providing directions for the use of pesticides and other dangerous substances (such as some fertilizers) that are distributed by government agricultural divisions rests with those government employees involved in the delivery of such products. These items are often purchased by the government in bulk quantities, but when distributed to the local farmer, they are repackaged into smaller amounts, and these repackaged quantities usually do not have warning labels included. Although most farmers may have previously received guidance on a particular product's use, this may not be true in every case. Therefore, it is essential that employees in the agricultural divisions make certain that all recipients of pesticides or fertilizers from their offices be questioned as to their knowledge regarding proper use of the products, and if necessary, the correct information provided. Copies of label information, including directions for use and any warnings concerning misuse, should always be provided, in a locally understandable language, to everyone receiving the products.

The adoption of modern ideas and concepts in the field of pest control should also be considered as an important strategy to reduce the quantity of pesticides used throughout the country. Integrated methods of pest control have been introduced into the agricultural programs of many nations, following field observations and tests of effectiveness. The FSM must carefully examine this strategy for pest control to determine the benefits, and possible negative consequences, of the various methods.

In the FSM, the existing legal instruments which address the management of pesticides, insecticides, and other similar substances, consist primarily of laws from the Trust Territory (TT) of the Pacific Islands period (post World War II until 1979) or new FSM state and national laws often based upon the TT regulations. The relevant regulations include two important sections of the FSM Code.

- FSM Code, parts 1 to 16 under Title 25, (from TT regulations Subchapter IV [Trust territory Pesticides Regulations] of Chapter 13 [Air. Land and Water Pollution] of Title 63 [Public Health, Safety and Welfare]) which specifically addresses pesticide control, including importation, distribution, sale, use, and disposal, and contains a listing of 'restricted use pesticides';

and the other is,

- FSM Code, parts 165 to 169 under Title 41 (from TT Code 15, September 1974) which lists banned and restricted chemicals.

Portions of these regulations have been adopted for use by the states and in some cases the states have created new regulations. Pohnpei state regulations closely follow the FSM Code parts 1 to 16 under Title 25. Other states have similar statues, and Yap State has regulations that do not specifically follow the FSM Code item by item, but still address all of the major points.

The state laws generally require that the importation of pesticides be registered, and in reality, the only major chemical management work being done by the states at this time focuses on pesticide registration. Registration forms that collect information concerning the import and use of pesticides have been developed by each state. Since state level staff are responsible for efforts to protect the local environment and they possess the most extensive and accurate knowledge of the situation in their particular state, it is reasonable for most of the monitoring and enforcement activities to be handled at the state government level. Comprehensive monitoring of chemical imports, including pesticides, will require additional (primarily staffing) resources to check the contents of in-coming shipments. However, without sufficient resources and support from the national level being devoted to the state monitoring and enforcement activities, the effort will be weak. The situation has the same "balance" as many of the shared constitutional powers contained in the FSM's statutes, implementation at the state level with technical assistance, standard setting, and external relationships handled at the national level.

The permitting process requests pertinent information (including formulation, amount, active ingredients, and source) to be provided to the state EPA (or equivalent) offices. These offices are then required to keep a registry of the types of substances that are brought into each state.

These laws also contain regulations pertaining to the certification of "applicators". An applicator is defined as the person who uses, or supervises the use of, restricted use pesticides. An applicator may be classified as "Commercial" or "Private" depending upon whether the use of the pesticide is on the applicators own property (Private Applicator) or if the pesticide application is a service being purchased by another party (Commercial Applicator). Commercial applicators must be certified as being competent in the safe use and handling of pesticides. Standards for certification include competence in and understanding of:

- labelling and terminology,
- safety factors, environmental consequences of pesticide use and misuse,
- characteristics of pests and pest biology,
- characteristics of pesticide formulation,
- use, maintenance, and calibration of application equipment, and
- application techniques.

The only commercial applicator (exterminator) in the country, who is certified in Pohnpei State, has explained that he obtains all chemicals from a vendor in the US state of Hawaii, and that no POPs substances are included.

The regulations state that private applicators are also required to be certified, however the standards are less stringent than those for a commercial applicator certification. Both classifications require that an application be submitted to their respective state EPA Office and an examination to be passed. The regulations also address the licensing of 'restricted use pesticide' dealers, delineating the records that must be maintained by dealers and commercial applicators. Also included are various aspects of pesticide importation, the restricting and banning of pesticides, the experimental use of pesticides, and penalties for non-compliance.

Generally all pesticides are poisonous when absorbed in appreciable quantities into the body through inhalation, consumption, or direct contact. Staff of the state agriculture offices and health departments report very few health problems attributed to pesticide use. If pesticide exposure should become a health issue in the future, then investigation of the causes must be undertaken, and a stronger effort to disseminate relevant information on safe pest management concepts should be launched. If the use of banned or restricted chemicals is discovered, then more stringent import inspections methods must be considered.

Other major issues and potential problems are long term storage sites, disposal sites, and areas where applications of pesticides (and fertilizers) have occurred over a considerable length of time possible contaminating the soil and nearby waters. The potential exists for pollution of inland waterways from the misuse of pesticides in certain locations on the high islands in the country. Marine pollution is also a concern, and the problem potentially could effect any island in the nation, both high and low. Run off, as a source of pollution, can contain pesticides, as well as many other substances destructive to fragile marine ecologies.

On the country's low-islands, the fresh water lens, upon which an atoll's agricultural efforts depend, is also susceptible to contamination by pesticides. Control of the problem is possible by altering the human activities that cause such pollution, by strict adherence to appropriate pesticide handling, storage, and disposal procedures. Data on these problems is insufficient, unknown chemicals may be involved, and in the past the focus of attention has typically been on damage to atoll taro patches by seawater. If the utilization of additional pesticides occurs in atoll agriculture, the knowledge of proper application methods, with consideration given to the special characteristics of atoll environments, must be provided beforehand.

There is a need to improve the collection and maintenance of data regarding pesticides. Specific to each state, many of the statistical yearbook types of data collections may provide some generic information on chemicals or products imported, but usually do not provide details on which specific (including restricted or banned) substances are included in the totals. Agriculture offices will have some information on the types of pesticides, insecticides, and fertilizers which they import and/or distribute. As mentioned, the EPA (or equivalent) office in each state is involved with registration of pesticides, and thus these state offices are the organizations most likely to have some long-term institutional knowledge of chemical management issues in each state. These offices are one of the most logical targets for technical assistance to improve the availability of quality pesticide information.

Goals And Objectives

The overall goal for this action plan is the safe management, on all islands in the country, of all aspects of pesticide and insecticide use (from importation to disposal). This includes all aspects in the 'local life' of these substances: import, marketing and distribution, storage, application, discard by the consumer/applicator, and final disposal.

The creation and on-going support for the FSM's National Hazardous Substance Expert Working Group (NHSEWG) is included in the overall Action Plan implementation strategy. The

NHSWEG will be the entity which provides national level oversight to the various POPs activities to take place under the project. As such, the group will provide support and coordination to the activities to address pesticide management, as well.

Action Plan #1, which addresses the various legal aspects of the POPs situation, will also include activities relating to the updating of all state and national laws and regulations pertaining to all aspects of pesticide import, marketing, storage, use, discard, and disposal.

Any obsolete pesticides marked for disposal will be included in the activities listed under Action Plan #2.

Action Plan #4 includes Public Awareness activities aimed at the general public. Information about pesticides will be included in these efforts.

In addition to the related objectives in other Action Plans, there are three specific objectives listed in this Action Plan #5 to achieve the goal of safe pesticide management.

1. To create, by 12 MAPSD and implement in each state once per year thereafter, a public awareness program that will increase the understanding and knowledge of specifically targeted sub-groups (such the agricultural and construction sectors), concerning the proper handling and use of all pesticides available in the FSM, and the potential hazardous consequences of pesticide misuse. This information will include all aspects of pesticide management, from procurement to disposal.
2. To improve, by 24 MAPSD, the capacity of the appropriate offices (at both the national and state level) and commercial entities, to successfully implement safe management of all aspects of the use of pesticides in the country (including importation, marketing and distribution, storage, application, discard, and disposal).
3. To improve, by 36 MAPSD, the capacity of the four state EPA Offices (or equivalent) to collect and maintain data regarding the registration and inventory of pesticides in the FSM.

Relevant Management Options

This project, targeting the increase knowledge among specific sub-groups of the general population in the FSM of the benefits of the proper use of pesticides and the negative consequences of pesticide misuse, is a relatively straightforward effort with few alternatives to be considered. Possible options would include hiring a consultant, adjusting the schedule of activities, changing the methods employed to disperse appropriate, up-to-date, and accurate information to the certain subgroups, and of utilizing private sector or non-government organization expertise to conduct parts of the information “campaign”.

The NHWEG will serve as a source of available in-country expertise, and facilitate the provision of relevant and accurate information to the nation’s leadership regarding all activities relating to the proper management of pesticides and related substances. This group will possess the

responsibility to monitor and evaluate the progress and effectiveness of the various POPs activities and subsequently to direct adjustments and changes as determined by the expert group.

Criteria For Evaluation And Prioritization Of Options

A consultant with expertise in the area of pesticides may be needed to assist the FSM National Government's Environmental Unit and the four state EPA (or equivalent) Offices with developing a community awareness up-scaling program. However, given the expertise that is available in-country, and the resources available via the Internet, it is anticipated that the need for a consultant may be minimal. Further, it is expected that the consultant recruited to assist with other FSM Action Plans (specifically #2 which addresses Hazardous Wastes and Contaminated Sites, and #4 which addresses Public Awareness issues), can provide assistance with regard to the pesticide aspects of those activities.

The scheduling of the activities for this Action Plan may be accelerated if tasks and objectives are completed ahead of the suggested timeline, and provided that funds are available to move on to the next step. As much of the general pesticide oriented awareness activities will be conducted as a subset of the overall Public Awareness Action Plan, a similar time frame for the development and implementation of the pesticide related activities will be followed.

The identification of all of the various pesticides and insecticides in use or storage in the FSM should be the top priority in this plan, as the urgency of these activities depends upon the nature of the substances being used. This work is to be completed under Objective #1 of Action Plan #2. If it is discovered that POPs or other hazardous substances are indeed in the pesticides being used in-country, then efforts must begin quickly to address the situation and minimize any on-going or potentially new human and/or environmental exposures. Once the exposure potential has been eliminated, or reduced as much as possible, the activity schedule can be quickened or slowed as determined by resource availability.

Determination of the content and the methods of presentation to be employed to increase public awareness can follow the objectives outlined in FSM Action Plan #4, dealing with Public Education and Awareness. The presentations to the general public developed by the National Hazardous Waste Awareness Program Working Group (NHWAPWG) in that Plan will include pesticide management information. The specific sub-groups to be targeted for a more technically expanded presentation will be identified and the NHWAPWG will organize a committee to guide the development of the presentations for those particular sub-groups, which is included in this action plan.

The FSM's Capacity Building Action Plan (#7) will include training activities that address various topics. One of these will be a strategy to improve the monitoring of the importation of POPs and other hazardous substances, and the importation of pesticides will be included in this strategy. As indicated in Objective #2 above, the effort to provide training to appropriate government and private sectors employees, and other appropriate persons at the state and national level, concerning the marketing and distribution, storage, application, discard, and disposal of pesticides and similar items will be developed under this Action Plan.

Efforts to improve the collection and management of pesticide data will be included under this Action Plan with respect to the registration work of the EPA Offices. Appropriate subsets of this information will be included in the POPs Information Clearinghouse (developed under Objective #7 of Action Plan #4).

Action Plan Implementation Strategy

The coordination of the activities aimed at safe management of pesticides will involve the FSM-HESA Environmental Unit, and the four state EPA (or equivalent) Offices. A consultant with knowledge regarding pesticides may be necessary, but it is anticipated that external expertise included in other Action Plans can be utilized. The HESA Environmental Unit will be responsible for arranging the technical assistance necessary, if in-country expertise is not available.

The responsibilities of the four state EPA (or equivalent) Offices will include the actual nation-wide surveys to identify stockpiled pesticides as is included under Action Plan #2. Determination of the hazardous status of any such items and disposal decisions would be included that Action Plan.

The work plan to address each of the numbered objectives above is as follows.

Objective #1 - To create, by 12 MAPSD and implement in each state once per year thereafter, a public awareness program that will increase the understanding and knowledge of specifically targeted sub-groups (such the agricultural and construction sectors), concerning the proper handling and use of all pesticides available in the FSM, and the potential hazardous consequences of pesticide misuse. This information will include all aspects of pesticide management, from procurement to disposal.

List of Activities/Time Frame/Responsible Parties:

1.1 Identify the specific sub-groups to be targeted for a more technically expanded presentation on pesticide issues (by 7 MAPSD - NG POPs Program Coordinator and State POPs Public Awareness Program Managers, in consultation with NHWAPWG) This activity can be completed at the NHSEWG Organizational meeting.

1.2 Compile a list of reference materials as sources of accurate and current information concerning the pesticides in use in the FSM. (by 9 MAPSD - NG POPs Program Coordinator and State POPs Public Awareness Program Managers, in consultation with NHWAPWG)

1.3 Create a list of pesticide-related topics to be included in the presentations, determine methods of knowledge transfer and develop presentation materials for each topic to be used for each intended sub-groups. (by 12 MAPSD - NG POPs Program Coordinator and State POPs Public Awareness Program Managers, in consultation with NHWAPWG)

1.4 Include review of targeted sub-group presentations (developed in Activity 1.3 above) in the agenda of the national level workshop scheduled in Activity 3.3 of Action Plan #4. (by 12 MAPSD - NG POPs Program Coordinator and State POPs Public Awareness Program Manager)

1.5 Perform the prepared presentations in each state once per year to each identified sub-group. (First presentation by 15 MAPSD and then again in next two years. – State POPs Public Awareness Program Manager and EPA staff)

Performance Indicator(s): Satisfactory progress in identification of sub-groups to be targeted, compilation of reference materials list, development of presentation materials for targeted sub-groups, review of presentation materials at national workshop, presentations performed

Resources Needs (1 – 12 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Presentation design and materials (avg. $3,000/state) $12,000

Total $12,000

Resource Needs (13 -24 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Presentation expenses/intra-state travel (avg. $2,000/state) $8,000

Total $8,000

Resource Needs (25 - 36 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Presentation expenses/intra-state travel (avg. $2,000/state) $8,000

Total $8,000

Resource Needs (37 -48 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Presentation expenses/intra-state travel (avg. $2,000/state) $8,000

Total $8,000

Objective #1 Total.....$36,000

Objective #2 - To improve, by 24 MAPSD, the capacity of the appropriate offices (at both the national and state level) and commercial entities, to successfully implement safe management of all aspects of the use of pesticides in the country (including importation, marketing and distribution, storage, application, discard, and disposal).

List of Activities/Time Frame/Responsible Parties:

2.1 Conduct a Needs Analysis, at both the National Environment Unit and state EPA Offices, of the focus, types, and content of training needed to improve the ability of both human resource and office operational systems (national level government, state level government, and private sector) to put in force safe management practices for all aspects

of pesticide use (by 12 MAPSD – NHEWG, NG POPs Program Coordinator and State EPA Offices)

2.2 Conduct a national level workshop to discuss the findings of Activity 2.1 and determine what approaches must be utilized and specific groups targeted, to improve safety with regard to pesticides in each of the areas: importation, marketing and distribution, storage, application, discard, and disposal (by 15 MAPSD – NHEWG, NG POPs Program Coordinator and State EPA Offices)

2.3 Determine appropriate training methods and/or venues (ex: long-term college based, attachments, short term seminars/workshops, on-the-job training) for the identified training area needs (by 18 MAPSD – NHEWG, NG POPs Program Coordinator and State EPA Offices)

2.4 Utilizing the information gathered in activities 2.2 and 2.3 above, identify, contact, and arrange currently available in-country training resources; recruit training consultants as needed, and (if necessary for content areas so far not addressed) subsequently identify, contact and arrange for out-of-country training resources (by 24 MAPSD – NHEWG, NG POPs Program Coordinator) Long term out-of-country training will be addressed in Action Plan #7.

2.5 Implement in country training activities as arranged - anticipate three trainings per state per year: 1) state EPA and agriculture office staff, 2) retail hardware stores, 3) commercial farming businesses (initiate by 27 MAPSD and ongoing – NHEWG, NG POPs Program Coordinator, State EPA Offices, consultants)

Performance Indicator(s): Satisfactory progress in identifying training needs, conducting workshop, arranging and implementing training activities as scheduled

Resource Needs (1 – 12 MAPSD):

State POPs Program/EPA Office remuneration	in State Cross-Project Budget
State level Training Needs Analysis expenses (avg $2,000/state)	$8,000
National level Training Needs Analysis expenses	2,000
Total	$10,000

Resource Needs (13 – 24 MAPSD):

State POPs Program/EPA Office remuneration	in State Cross-Project Budget
National Workshop on Training Needs	$12,000
National Workshop expenses	$2,000
Total	$14,000

Resource Needs (25 – 36 MAPSD):

State POPs Program/EPA Office remuneration	in State Cross-Project Budget
Consultants (3 months)	$48,000
Training session expenses - 3 per year per state (EPA/agriculture, hardware stores, farming businesses (avg. $2,000 per session x 3 per state)	24,000
Travel – NG POPS Coordinator and Consultant - Kosrae, Chuuk, Yap	12,000

Total $84,000

Resource Needs (37 - 48 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Consultants (3 months) $48,000
Training session expenses - 3 per year per state (EPA/agriculture, hardware stores, farming businesses (avg. $2,000 per session x 3 per state) 24,000
Travel – NG POPS Coordinator and Consultant - Kosrae, Chuuk, Yap 12,000

Total $84,000

Objective #2 Total.....$192,000

Objective #3 - To improve, by 36 MAPSD, the capacity of the four state EPA Offices to collect and maintain data regarding the registration and inventory of pesticides in the FSM.

List of Activities/Time Frame/Responsible Parties:

3.1 Identify staff in each state EPA Office to be responsible for pesticide data collection and database input/maintenance related work (by 15 MAPSD – State EPA Offices)
3.2 Develop new expanded pesticide data collection procedures to gather relevant information related to all aspects of the 'local life' of these substances: import, marketing and distribution, storage, application, discard by the consumer/applicator, and final disposal (by 18 MAPSD – NHWEG, NG POPs Program Coordinator, State EPA Offices) The new registration procedures will be included in the trainings conducted under Objective #2.5.
3.3 Identify and procure needed computer and associated equipments, database software, and related supplies for each state (by 18 MAPSD - NG POPs Program Coordinator, in consultation with State EPA Offices)
3.4 Implement new data collection procedures and update pesticide databases in each state (by 30 MAPSD – NG POPs Program Coordinator, State EPA Offices) Procedures to be supported by legislation developed in Action Plan #1.
3.5 Identify appropriate pesticide data to be included in the POPs Information Clearinghouse, developed under Objective #7 of Action Plan #4 (33 MAPSD and update as appropriate – NG POPs Program Coordinator, State EPA Offices)

Performance Indicator(s): Satisfactory (as scheduled) progress in identifying state level staff to handle pesticide data work, developing new data collection procedures, procurement of computer equipment, new procedures implemented, pesticide databases updated, information shared with POPs Information Clearinghouse

Resource Needs (13-24 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Computer and related equipment & software (avg. $5,000/state) $20,000
Data collection expenses (avg. $2,000/state).....$8,000

Total $28,000

Resource Needs (25 - 36 MAPSD):
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Data collection expenses (avg. $2,000/state).....$8,000

Total $8,000

Resource Needs (37-48 MAPSD):
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Data collection expenses (avg. $2,000/state).....$8,000

Total $8,000

Objective #3 Total.....$44,000

Action Plan #5 - Total Budget $272,000

4.3.6 Action Plan #6 – Protection of the Marine Environment from Oil and Other Chemical Spills from Sunken and Grounded Vessels

Context and Analysis of the Issue:

Similar to many island nations, the FSM depends heavily on the ocean for its livelihood. The importance of coastal and marine environments to every aspect of the lives of these people cannot be overstated, and therefore the impact of any marine pollution is a major concern. Spills of oil and other chemicals into the marine environment from sunken and grounded ships pose major risks to resources that support the lives and livelihoods of the islanders. Therefore, strategies are needed for safeguarding FSM's marine environment from pollutants, by removal of, and minimization of, marine spills of oil, other petroleum products and hazardous substances from sunken and grounded vessels in the FSM.

During the World War II, the FSM was a major base for the Japanese military, similar to America's Pearl Harbor in strategic significance. More than 60 years have passed since the end of the war, and yet the legacy remains in the abandoned machinery of war: tanks, weapons, unexploded ordinance, abandoned fuel and other hazardous substances sit lurking in the deep, inside the wrecks and cargoes of vessels sunk. In Chuuk State alone, more than 46 vessels were sunk in the lagoon (63 km/39 mi in diameter) and today it is an underwater museum which is one of the world's best diving spots. There are similar situations in the other states as well. A recent incident was the oil spill from USS Mississinewa, a fuel tanker sunk in Ulithi atoll during WW II. Although the U.S. helped with the clean-up, the incident is a clear indication of the hazards associated with these vessels. In addition, in the past several years as the FSM economy grew, more ships and vessels have entered the area, and as a result there are several grounded ships, especially fishing vessels, scattered on reefs and sunk in the lagoons. This not only creates

disturbing sight, but it also creates a contamination problem for the surrounding marine environment. In the past ships have sunk and been grounded on the reef in Pohnpei and Kosrae states as well and there is every reason to believe that more are to come. Not only sea vessels pose risks, but airplanes crashed into the seas of the FSM during WWII and may again in the future. In 2001 a plane narrowly missed crashing into the lagoon near the Pohnpei airport.

The oil, other chemicals, and unexploded ordnance still on board many of the sunken and grounded vessels pose a grave and imminent danger to the people, marine, coastal and fisheries of the FSM and the whole Pacific region in general. While there have been previous efforts by different governments' departments and agencies to deal with oil and wreck removal, these were carried out on an ad-hoc basis and unsystematic processes. To be successful and sustainable, it is imperative that FSM develops, implements, and provides continuous support to an action plan dealing with all aspects of marine pollution, and particularly oil and other potential hazardous substances from sunken and grounded vessels.

Goals And Objectives

The ultimate goal of the Action Plan is to reduce, and where and when appropriate, eliminate the risks of marine pollution caused by oil and other chemicals emanating from existing and future sunken and grounded vessels in the waters of FSM. Specific objectives and tasks are required to fully attain this goal, and these must follow a specific sequence of targeted activities. This Action Plan requires many players at different levels, and therefore needs the commitment of technical, financial, political, and other resources in order to ensure its sustainability and success.

The Action Plan includes four major objectives with activities and specific tasks to be implemented to attain the overall goal.

1. To establish, by 24 MAPSD, a database inventory of information (including, but not limited to vessel name and nationality, location; cargoes potentially still on board, depth, condition) on sunken/grounded vessels in the FSM; and to assess threats to marine and shoreline environments potentially affected by substances leaking from these vessels..
2. To have prepared and ready for implementation, by 24 MAPSD, a set of specific Operational Plans to guide the clean-up procedures for each site/vessel which has been categorized as "high risk".
3. To have enacted, by 30 MAPSD, legislation addressing the various negative impacts of POPs and other hazardous substances released from sunken or grounded vessels.
4. To Implement, by 36 MAPSD, procedures to address: 1) Non-"high risk" vessels/sites, 2) future sunken or grounded vessels with potentially hazardous cargoes, and a Harbor Pilot program in each state.

The first objective of the Plan is to establish current baseline information on all sunken and grounded vessels, and sound assessments of potential risks from each vessel. This objective can be met by using modern available technology, including but not limited to geographical information system (GIS), bathymetric mapping, and others. In addition, the collection of samples (from cargoes on vessels which pose potential pollution risks to marine environment)

for analysis is crucial in order to ascertain the types of chemicals and their specific risk properties. Equally important is an assessment of the quantities of each pollutant and conditions of its storage, using such tool as corrosion assessments. It is further envisaged that a tool to pull all this information together is needed and a typical or modified environmental impact assessment or risk assessment method would be a are good candidates to serve this purpose.

The second objective is to establish clean-up programs. Based upon results of the first objective, clean-up programs will then be developed specifically for those vessels that are identified as high risk. Given the complexities in planning and executing clean-up activities, along with limited local resources capable to undertake such tasks, it may be more realistic to employ the assistance of outside experts and institutions. More important, associated costs are expected to be very high, thus requiring outside financial assistance. Hence, an important task is to identify and secure these funds.

The third objective is to establish a legal framework to support the whole endeavor. This involves the review of existing legislation both at the national and state levels, then to amend where necessary, and create new legislation and regulations. This effort to establish national and state laws will be completed as part of Objective #2 of Action Plan #1. However, during the whole process, there is a need to review our international obligations under various conventions and to further harmonize our internal legislation/regulations with the requirements of such conventions.

This Action Plan's final objective is to develop and implement a program to deal specifically with vessels that fall outside of those covered under Objective #2 and any future sunken or grounded vessels. Activities such as preparation of contingency plans, creation of state level rapid response teams and a National Emergency Fund to support these teams, and harbor pilot programs are needed to successfully accomplish this objective.

Relevant Management Options

This project, targeting the protection of the FSM's marine environment from hazardous substance spills from sunken and grounded vessels, can be considered as a relatively straightforward and systematic effort, although the scope of the work to be done is extensive and the costs to safely remove substances from vessels located at depths of 100 or more feet will be substantial. The accompanying activities are relevant to the prevention of pollution form vessels sunken in the past and similar future incidents.

A decision to utilize professional, private sector expertise to conduct select activities must be considered. It will be necessary to secure the services of overseas laboratories for testing of unknown substances. Local capacity should be developed to the extent that it is cost effective. Otherwise, for analysis which requires a level of skill or analytical hardware beyond the local capacity, out-of-country facilities must be utilized. This will require that local staff be given training in sample collection and preparation of the samples for shipping to overseas locations.

The South Pacific Regional Environment Program (SPREP) and the South Pacific Geoscience Commissions (SPOAC) will be called upon to provide technical assistance for specific activities under this Action Plan. Consultants will be necessary to conduct trainings, assist with assessments, and plan development.

In some cases it may be necessary to determine "ownership" of certain vessels, and there may be issues of historical significance and/or cultural importance to be considered. The FSM may need to officially contact other nations regarding specific details with regards to details about these vessels. Therefore, the FSM NG Departments of Foreign Affairs (DFA) and Justice (DOJ) will have participatory roles to play. For information about the logistics of travel to the site of a sunken vessel, the involvement of the FSM NG Department of Transportation, Communications and Infrastructure (TC&I) may be required. The Department of Marine Resources (DRM) and Department of Economic Affairs (DEA) could also have interest in the matter of sunken ships, as the potential for damage to marine resources exists and subsequently sections of the economy which rely on marine-based operations would be effected.

The overall legal framework to support all of the above will be completed in the accompanying Action Plan dealing with the various legal framework aspects of POPs and other hazardous items which are located on sunken or grounded vessels.

There are five possible management scenarios to implement the various activities under this Action Plan:

- The Plan is managed at the national level with counterparts at the state level
- The Plan is totally managed at the national level with no state counterparts
- The Plan is managed only at the state level with no national counterparts
- The Plan is managed by outside consultants on contract
- The Plan is managed by non-government entities

Criteria For Evaluation And Prioritization of Options

The following are the criteria for evaluating and prioritizing the five relevant management options for this Action Plan. The activities and objectives need the collaboration of both the national and the state governments and therefore needs to be implemented jointly. To have total management of the Action Plan only at the National, or only at the State level, would be inefficient by not taking advantage of the expertise available at both levels, however careful coordination will be necessary to avoid duplication of effort.

Another option is contracting external expertise to manage the Action Plan, however, this would be even more costly than the latter and thus must be selected only when necessary. It is recognized however, that although external management would also be costly, it must be considered as a viable option to undertake activities included in this Action Plan which require a level of expertise not yet available within the FSM.

The last option is management by non-government entities, however they may not have the resources or capacity to undertake the activities required in this Action Plan.

Local expertise can complete the task of compiling the initial information needed to create the database of sunken vessels.

A consultant with expertise in the area of hazardous cargoes on sunken or grounded vessels will be needed to assist the FSM Environmental Health Unit and the four state EPA offices (or equivalent) with identifying what kind of items may be on vessels in their states. Training can be provides by a consultant so as to increase local capacity to safely examine vessels/sites and identify cargo items.

The identification and collection of details about the vessels should be completed as soon as possible, particularly for known "high risk" vessels. Vessels which are currently leaking must be given top priority for removal of all hazardous substances, so as to minimize marine environment exposures.

SPREP has developed Guidelines on Marine Spill Contingency Plans to assist in classification of vessel situations:

- High Risk-Management Plan: level of risk is so high that the hazard has to be eliminated or minimized through direct intervention
- Medium Risk –Management Plan: the level of risk is deemed "acceptable," subject to a plan to ensure the risks remain at the acceptable level. Plans should focus on isolating the hazards; excluding any transmission medium; minimizing the impact on the environment; monitoring program
- Low Risk- Management Plan: sites where hazards are absent; these sites require no risk management activity apart from the occasional monitoring

The scheduling of the activities for this project may be accelerated if objectives are completed ahead of the timeline as suggested above, and funds are available to move onto the next step. However, the funds necessary for development of contingency plans, response teams, and the removal of hazardous substances from currently leaking vessels, must be dedicated during the initial phase of the POPs efforts so that these activity can proceed as rapidly as possible.

Action Plan Implementation Strategy

The primary coordination of the activities of this Action Plan will involve the FSM-HESA Environmental Unit, which will be responsible for nation-wide oversight and also arranging the technical assistance necessary for tasks for which in-country expertise is not available. The first step will be the recruitment of an individuals to coordinate the activities required under this Action Plan. This recruitment will begin within three months after program start date as prompt action is necessary to prevent further damage to the marine environments.

It is anticipated that the actual assessment of the status of identified high-risk vessels and the subsequent action(s) required to protect the marine environment will be completed first by

external experts contracted for this purpose. If the number of vessels to be "neutralized" warrants (and expectation is that this *will* be the situation), staff will be recruited at the state levels to be trained for this work.

At the time of the development of the FSM's National POPs Implementation Plan, it is unknown how many sunken or grounded vessels actually contain POPs or other substances that will damage marine and coastal environments. Thus, it is difficult to determine what technical resources and what levels of financial resources will be needed to effect a complete removal of POPs and other hazardous substances from the identified high risk vessels in the country. The implementation strategy for this Action Plan will focus on the assessments, the creation of plans (with the estimated budgetary detail) to clean up vessels in a representative sampling of circumstances, the creation of appropriate legislations to ensure protection of the nation's marine environments, and the development of future plans to prevent damage to the marine environment and to control such damage as may result from a spill of POPs and/or hazardous substances from a sunken or grounded vessel. Unless POPs are identified among the substances on such vessels, the actual clean-up effort will most likely be funded by sources other than the Stockholm convention.

The responsibilities of the four state EPA (or equivalent) Offices will include the monitoring the activities and logistical assistance. These offices will also provide input for the development of Operational Plans for specific vessels in their respective states, provide input and advice to state leaders concerning legislation, and assist with the development of that state's 'harbor pilot' program.

The work plan to address each of the numbered objectives above is as follows.

Objective #1 - To establish, by 24 MAPSD, a database inventory of information (including, but not limited to vessel name and nationality, location; cargoes potentially still on board, depth, condition) on sunken/grounded vessels in the FSM; and to assess threats to marine and shoreline environments potentially affected by substances leaking from these vessels.

List of Activities/Time Frame/Responsible Parties:

1.1 Recruitment of "National Sunken Vessel Program Coordinator" (NSVPC) individual to coordinate activities of this Action Plan (within 3 MAPSD – NG POPs Program Coordinator)

1.2 Identify and assess sources for technical and financial assistance (by 6 MAPSD – NSVPC, NG POPs Program Coordinator, NHSEWG)

1.3 Identification of the "ownership" of vessels or wrecks and determine the liability of the "owner" (by 9 MAPSD – NSVPC, DFA, DOJ, and possibly international marine law expertise)

1.4 Conduct research to identify number of grounded/sunken vessels; location; quantities of cargoes still on board and history of oil released and use information collected to establish national database of sunken/grounded vessels using GIS system (by 12 MAPSD – NSVPG)

1.5 Undertake assessment (EIA, risks, corrosion etc) for determining potential release and impacts of oil/hazardous materials from vessels and determine "high risk" vessels. (by 24 MAPSD – NSVPC, NG POPs Program Coordinator)

1.6 Undertake shoreline assessments of the areas under threat and determine the resources at risk and any ecological damage which has already occurred (by 24 MAPSD – NSVPC, DMR, DEA)

Performance Indicator(s): Satisfactory progress recruitment of NSVPC, establishment of database, financial assistance secured, vessel and shoreline assessments completed, ownerships of vessels determined.

Resources Needs (1 – 12 MAPSD):

Contractual Services - FSM NSVPC (9 months)	$15,000
Communications (NSVPC)	2,000
Total	$17,000

Resource Needs (13 -24 MAPSD):

Contractual Services - FSM NSVPC	$20,000
Communications (NSVPC)	2,000
Estimated Contractual Services – "High Risk" vessels - Identification	100,000
Estimated Contractual Services – Shoreline Damage - Assessment	100,000
Total	$222,000

Resource Needs (25 - 36 MAPSD):

Contractual Services - FSM NSVPC	$20,000
Communications (NSVPC)	2,000
Total	$22,000

Resource Needs (37 - 48 MAPSD):

Contractual Services - FSM NSVPC	$20,000
Communications (NSVPC)	2,000
Total	$22,000

Objective #1 Total $283,000

Objective #2 - To have prepared and ready for implementation, by 24 MAPSD, a set of specific Operational Plans to guide the clean-up procedures for each site/vessel which has been categorized as "high risk".

List of Activities/Time Frame/Responsible Parties:

2.1 Determine possible scope of contingency arrangements for off-loading cargoes (by 18 MAPSD – NSVPC, NG POPs Program Coordinator, with advice from TC&I, and if necessary external expertise such as SPREP)

2.2Determine possible scope of contingency arrangements for spill containment, recovery and disposal (by 18 MAPSD – NSVPC, NG POPs Program Coordinator, with advice from TC&I, and if necessary external expertise such as SPREP)

2.3 Assess and physical or ecological constraints salvage/clean-up operations (by 24 MAPSD – NSVPC, NG POPs Program Coordinator, with advice from MRD, TC&I, and if necessary external expertise such as SPREP)

2.4 Create Terms of References and determine cost estimates for sets of clean-up procedures necessary to eliminate the contamination threat to the marine environment (by 24 MAPSD – NSVPC, NG POPs Program Coordinator, with advice from MRD, TC&I, and if necessary external expertise such as SPREP)

Performance Indicator(s): Satisfactory progress in identification contingency arrangements, assessment of clean-up operations constraints, and cost estimates.

Resource Needs (13 -24 MAPSD):

Contractual Services - FSM NSVPC	included in Objective #1
Consultant Services - Salvage/clean-up/containment plan development (1 yr)	$50,000
Travel – NSVPC and Consultant - Kosrae, Chuuk, Yap	12,000
POPs/EPA Group remuneration	in State Cross-Project Budget
Total	$62,000

Objective #2 Total $62,000

Objective #3 - To have enacted, by 30 MAPSD, legislation addressing the various negative impacts of POPs and other hazardous substances released from sunken or grounded vessels.

List of Activities/Time Frame/Responsible Parties:

3.1 Assist with legal consultant recruited in Action Plan #1 to ensure that all issues involving sunken and grounded vessels as a source of POPs and other hazardous substances are included in the legislation to be developed in that Action Plan (by 18 MAPSD – NSVPC, NG POPs Program Coordinator, with advice from DOJ, MRD, and if necessary external expertise such as SPREP)

3.2 Assist with the public awareness programs to be conducted under Objective #3 of Action Plan #1 (by 30 MAPSD – NSVPC, NG POPs Program Coordinator)

Performance Indicator(s): Legislation enacted at national and state levels satisfactory addresses all aspects of sunken or grounded vessels as a source of POPs and hazardous substances

Resource Needs (13 -24 MAPSD):

Contractual Services - FSM NSVPC	included in Objective #1
Travel – NSVPC and Consultant - Kosrae, Chuuk, Yap	included in Objective #2

POPs/EPA Group remuneration ..... in State Cross-Project Budget

Objective #3 Total..... no additional funds needed for this objective

Objective #4 – To implement, by 36 MAPSD, procedures to address: 1) Non-"high risk" vessels/sites, 2) future sunken or grounded vessels with potentially hazardous cargoes, and 3) a Harbor Pilot program in each state.

List of Activities/Time Frame/Responsible Parties:

4.1 Using information from the database developed in Objective #1, identify the "medium" and "low" risk vessels, and determine possible scope of future contingency arrangements for off-loading cargoes, and spill containment, recovery and disposal for "medium" risk vessels and monitoring programs for "low" risk (by 18 MAPSD – NSVPC, NG POPs Program Coordinator, with advice from TC&I, and if necessary external expertise such as SPREP)

4.2 Establish a "Marine Environment Protection - Rapid Response Team" (MEP-RRT) in each state's Emergency/Disaster office, necessary training workshops conducted (by 24 MAPSD – NSVPC, NG POPs Program Coordinator, State EPA Offices, State Emergency/Disaster office, and if necessary external expertise such as SPREP)

4.3 Establish a National "Stricken Vessel" Emergency fund for immediate use by the MEP-RRT in the event of a grounded or sunken vessel with potentially hazardous cargo or other toxic substances on board. (by 24 MAPSD – NSVPC, NG POPs Program Coordinator)

4.4 Establish a "Harbor Pilot" program in each state (by 36 MAPSD – NSVPC, NG POPs Program Coordinator, Consultant, with advice from, TC&I, and if necessary external expertise such as SPREP)

Performance Indicator(s): Satisfactory progress in contingency and monitoring plans, MEP-RRT and Emergency fund established, and Harbor Pilots operating in each state.

Resource Needs (13 -24 MAPSD):

Contractual Services - FSM NSVPC	included in Objective #1
Consultant - MEP-RRT Trainings (3 months)	$48,000
National MEP-RRT Training Workshop (5 days x 3 participants/state)	16,000
National MEP-RRT Training Workshop expenses	2,000
State MEP-RRT Training Workshop (5,000/state)	20,000
Travel – NSVPC and Consultant - Kosrae, Chuuk, Yap	24,000
RRT Equipment and Supplies (est. avg. $20,000/state)	80,000
State POPs Program/EPA Office remuneration	in State Cross-Project Budget
National "Stricken Vessel" Emergency Fund (for MEP-RRT)	100,000
Total	$278,000

Resource Needs (25 - 36 MAPSD):

Contractual Services - FSM NSVPC	included in Objective #1

Consultant - "Harbor Pilot" program development and training (3 months).....$48,000
State "Harbor Pilot" Training Workshops (5,000/state).....20,000
Travel – NSVPC and Consultant - Kosrae, Chuuk, Yap.....12,000

Total.....$80,000

Resource Needs (37 -48 MAPSD):
Contractual Services - FSM NSVPC.....included in Objective #1
Consultant MEP-RRT Refresher Trainings (1 months).....$16,000
State MEP-RRT Refresher Training Workshops (5,000/state).....20,000
Travel – NSVPC and Consultant - Kosrae, Chuuk, Yap.....12,000
State POPs Program/EPA Office remuneration.....in State Cross-Project Budget

Total.....$48,000

Objective #4 Total.....$406,000

Action Plan #6 - Total Budget.....$751,000

4.3.7 Action Plan #7 – Capacity Building

Context and Analysis of the Issue:

The FSM's biodiversity, both marine and terrestrial environments, are a priority concern with regard to contamination by POPs and other hazardous substances. Direct and indirect exposures to these substances have detrimental impacts on human and wildlife morbidity and mortality through bioaccumulation. The current level of pollution from solid and liquid waste, in the FSM primarily derived from domestic sources, is increasing, particularly in the vicinity of the major population centers. The effect of pollution on the terrestrial, marine, and freshwater environments is a major concern for the sustainable development of the FSM. The nation's small land size, isolation, and the subsistence livelihood dependence on the environment by a large portion of the populace, greatly increases the nation's vulnerability to contamination by solid, liquid, and air-borne types of hazardous substances, including toxic wastes, chemicals, and other dangerous products and by-products.

With the strong emphasis by the FSM's national and state governments on economic development and the current population growth rate it is anticipated that the generation of waste, both solid and liquid, will considerably increase both in quantity and the number of different types in the future. The institutional weakness of environmental health management is exacerbated by the dis-harmonization and inconsistency between various pieces of legislation and a scarcity of properly trained human resources. This situation creates a major impediment to adequately support the process of POPs management and enforcement.

As is indicated in an separate Action Plan, FSM law (Title 25. Environmental Protection Act, Subtitle 1. Trust Territory Environmental Quality Protection Act) bans or restricts the importation of many dangerous substances, including most POPs containing substances, into the country. State Environmental Protection Agencies (EPA or equivalent) require advance import notification of all pesticides to ensure proper inspection upon arrival into the country. However, inspections of imports are conducted by customs officials who are not properly trained to identify hazardous chemicals or similar substances.

Personnel in each of the four states line agencies presently have the capacity to test for PCBs, but not all of the POPs and other hazardous substances. For other substances, different kits and associated trainings will be needed. External expertise will be necessary to provide this training and also assist with identification as necessary. Local (in-country) laboratory capacity is not sufficient to test and identify most POPs and other hazardous substances, thus the assistance of out-of-country laboratory services is necessary. Presently, no formally organized pool of expertise in the area of hazardous substance management exists in the FSM. The State EPA Agencies have varied, but limited, levels of capacity, depending on past educational attainments of the staff and other relevant trainings which have been provided, including: workshops, on-the-job instruction, and more formal instructional and courses at overseas intuitions or laboratories.

There is a need to develop and organize an appropriate in-country body of POPs and other hazardous substances expertise so that appropriate local capacity exists to address problems in this important area. Lower in-house country costs could be realized by utilizing a regional approach to some of the training work. The critical shortage of trained professionals, across the various facets of the environmental health sector, is a significant contributing factor to environmental health concerns in this country. The situation causes the FSM to have to rely on expatriate services which can add significant cost to the consumers since local laboratory and staffing is not sufficient to conduct the necessary quality control for many toxic substances.

Another issue of concern is the dangerous implications of not properly using, storing, and disposing these toxic materials. A number of these dangerous substances have been introduced to the islands of the nations in the region as far back as WWII and possibly earlier (i.e. PCB contamination in Tanapag Village on Saipan in the Commonwealth of the Northern Marianas Islands and also at Cocos Lagoon in Guam). Many of these substances may have been used during the construction of the various islands' physical infrastructures and the hazardous properties of the substances were unknown at that time. Other hazardous materials have been brought to the FSM in the form of pesticides, insecticides, fertilizers, and in various kinds of equipment. Although the number and quantities of these hazardous substances may be relatively small to global averages, the small size and fragile ecosystems of the nation's island result in situation in which even "small" quantities of a contaminant may pose grave and irreparable damage to delicate marine and terrestrial ecosystems, in addition to numerous health problems among residents.

At the present time, in each FSM State, a number of hazardous and potential hazardous materials have been identified by the EPA personnel during the second phase of the POPs in PICS project. Inventories have been compiled listing the pertinent details of these identified substances. Many of these materials have been collected and removed for proper disposal elsewhere. However,

some have not, and remain located where human exposure or environmental contamination is possible. The possibility still exists that other unidentified hazardous materials remain and have yet to be located. The clean up of contaminated sites completes the process of restoration of the land to a safe status similar to pre-contaminated days. Identification, assessment, rehabilitation will require expertise beyond that available in-country. The involvement of the public is thus necessary as it is possible that additional contaminated sites may be discovered. The on-going task of checking for contaminated sites cannot be totally abandoned until the import of POPs is completely prohibited.

Building the various facets of the local capacity to deal with the issues surrounding POPs and other hazardous substances will initiate the momentum for institutional and infrastructure strengthening in environmental health legislation and regulations that protect the islands of the FSM.

1. Goals and Objectives

The FSM's Strategic Development Plan (SDP) includes an Environment Matrix of Strategic Goals and Objectives which are relevant to the NIP. Many of these capacity building activities are addressed in Action Plans #1 through #6, and this is indicated in the following list. Implementation methods in the NIP focus primarily on national and state level workshops, and in most cases external expertise is involved in conducting these sessions and local counterparts also have the opportunity to work side by side with these consultants.

The goals and objectives below that are *not elsewhere addressed* in this NIP, are augmented with timeframe, responsible parties, and required resource information, and are listed following the SDP Environment Matrix of Strategic Goals and Objectives.

Goal and Objective numbers are the same as utilized in the SDP .

SDP Environment Matrix Goal #2: Improve and enhance the human environment (improve waste management – reduce, recycle, and re-use) and pollution control.

Capacity Building Goal 1: To be fully prepared in identifying known and suspected PCB contaminated sites by the end of 2008.

Objective 1: By the end of 2007, all line agencies will be fully trained in the utilization of the PCB test kits. – Addressed in Action Plan #3

Objective 2: By the end of 2007, a contaminated site training will be conducted for all FSM States, led by the national government. – Addressed in Action Plan #2

Objective 3: By the end of 2008, all line agencies will have established and carry out an information sharing protocol on PCB management. – Addressed in Action Plan #3

Objective 4: By the end of 2008, all line agencies will have incorporated the above information sharing protocol into the existing Clearing House Mechanism (CHM) Project at COM-FSM. – Addressed in Action Plan #4

Capacity Building Goal 2: To diligently begin monitoring protocols to enforce the POPs chemicals importation ban by 2008.

Objective 1: By the end of 2007, all line agencies will have been fully trained in monitoring, collection and handling of POPs chemicals to fully enforce any new importation. – Addressed in Action Plans #4 and #5

Objective 2: By 2008, an institutional arrangement would be in place to link Customs Clearance (Tariff Code as reported on the Declaration) with relevant state agencies responsible for regulating the imports of control substances. – **See Below**

Capacity Building Goal 3: To safely contain the existing stockpiles at a qualified laboratory (storage) facility for safe dispatch/export by the beginning of 2008.

Objective 1: Training in the proper handling and safe storage of POPs chemicals for all four states by 2008. – Addressed in Action Plan #2

Objective 2: Provide training for one representative from each of the four states and national government on proper protocols for the removal of POPs from the FSM by 2009. – Addressed in Action Plan #2

SDP Environment Matrix Goal #6: Improve environmental awareness and education, and increase involvement of citizenry of the FSM in conserving their country's natural resources.

Capacity Building Goal 3: To conduct public education and raise awareness on POPs until 2012.

Objective 1: By the end of 2007, all line agencies will have actively utilized the CHM to educate and increase the awareness of the general public on POPs for the next five years. – Addressed in Action Plan #4

SDP Environment Matrix Strategic Goal 9: Enhance and employ in-country technical capacity to support environmental programs.

Capacity Building Goal 4 (Goal II): To increase, upgrade and develop the knowledge and skills of the local and line agencies' capacities in POPs management by the end of 2012.

Objective 1 (A): By the end of 2008, all line agencies will have conducted initial internal and external assessments to identify capacity, resources and needs gaps in POPs management and revisited every three to five years. – **See below**

Objective 2 (B): By the beginning of 2008, systematic training programs will be conducted for and/or by all relevant agencies to ensure full and sustainable management, monitoring and researching on POPs. – **See below**

Objective 3 (C): By the beginning of 2008, the relevant agencies will have launched a scholarship program to financially support an undergraduate/graduate/post-graduate candidate per State to promote in-country expertise on POPs. – **See below**

Objective 4 (D): By the end of 2007, a POPs Fellowship Exchange Program will be launched and conducted on a rotational participation per State by at least one line agency to participate in a peer/regional cross-training. – **See below**

Objective 5 (E): By the end of 2007, a national workshop will be conducted annually with full participation by all relevant agencies to enhance their technical capacities in POPs management. – **See below**

Objective 6 (F): By the beginning of 2008, all relevant agencies will systematically upgrade and develop their laboratory and equipment/test kits to be sustainable in POPs management. – **See below**

Relevant Management Options

The POPs Convention has been ratified by the FSM Congress; however there are necessary components of a NIP to have in place in order to fully implement this legally binding treaty. To enforce the regulations and effectively administer the infrastructure of this Convention, both human and financial resources are needed to perform these functions. Investing in human resources strengthens management capacity leading to improvement in policy and planning.

An assessment on existing legal, institutional, administrative, and technical infrastructures provides guidance on identifying priorities, improving on shortcomings, linkages to the national strategic plan, improving on documentation and monitor protocols and highlighting areas for learning and improvement for the investment in capacity building. This promotes a proactive attitude and signals to supporters and strategic allies for professional and financial outcomes.

Both an internal and external assessment should be conducted to fully gauge the gaps and needs to enforce and effectively implement the protocols under the NIP to achieve the POPs Convention's mandates. SWOT Analysis can internally determine a line agency's strengths and weaknesses which could be externally transformed into opportunities and threats. Determining the weaknesses and converting them into threats can be interpreted as a line agency's capacity gaps and needs. A Capacity Needs Assessment is a more external and intensified evaluation to be administered by an independent party not only to determine the overall capacity gaps and needs but provide recommendations to overcome these gaps and meets the needs. This can be modified from the National Capacity Self-Assessment of the Rio Conventions currently administered by the FSM Department of Economic Affairs.

Criteria for Evaluation and Prioritization of Options

Capacity Building is significantly ranked in the consolidated listing of issues and actions from the POPs Report of the Workshop on Priority Setting and Action Plan Development.

The outcomes and recommendations from the SWOT Analysis and Capacity Needs Assessment will set the criteria for evaluation and priority of options for line agencies to increase, upgrade and develop their knowledge and skills.

The work plan to address each of the Capacity Building objectives not addresses elsewhere in this NIP document is as follows. (Note: Numbering follows a 'Matrix Goal.Capacity Building Goal.Objective sequence

SDP Environment Matrix Goal #2: Improve and enhance the human environment (improve waste management – reduce, recycle, and re-use) and pollution control.

Capacity Building Goal 2: To diligently begin monitoring protocols to enforce the POPs chemicals importation ban by 24 MAPSD.

Objective 2.2.2: By 24 MAPSD, an institutional arrangement would be in place to link Customs Clearance (Tariff Code as reported on the Declaration) with relevant state agencies responsible for regulating the imports of POPs and other controlled hazardous substances.

List of Activities/Time Frame/Responsible Parties:

2.2.2.1 Discussions completed between NHSEWG and FSM Customs Office and "Warning System" developed to determine if POPs or other hazardous substance are being imported (by 12 MAPSD - NG POPs Program Coordinator, NHSEWG, FSM Department of Finance)

2.2.2.2 Conduct National Training Workshop to train FSM Customs staff on POPs "Warning System" (by 12 MAPSD - NG POPs Program Coordinator, FSM Department of Finance)

2.2.2.3 Conduct state level Training Workshop to train FSM Customs staff on POPs "Warning System" (by 18 MAPSD - NG POPs Program Coordinator, FSM Department of Finance)

Performance Indicator(s): Satisfactory progress with "Warning System" developed, training workshops conducted.

Resources Needs (1 – 12 MAPSD):

National Workshop – Training of "Warning System" (3 days, 2/state)	$10,500
National Workshop expenses	$2,000
Total	$12,500

Resources Needs (13 – 24 MAPSD):

State "Warning System" Training Workshops (2,000/state)	$8,000
Travel – NG POPs Program Coordinator, DOF Rep - Kosrae, Chuuk, Yap	12,000

Total $20,000

Objective #2.2.2 Total.....$32,500

SDP Environment Matrix Strategic Goal 9: Enhance and employ in-country technical capacity to support environmental programs.

Capacity Building Goal 4: To increase, upgrade and develop the knowledge and skills of the local and line agencies' capacities in POPs management by 48 MAPSD.

Objective 9.4.1: By 18 MAPSD, all line agencies will have conducted initial internal and external assessments to identify capacity, resources, and needs gaps in POPs management (revisited every three to five years).

List of Activities/Time Frame/Responsible Parties:

9.4.1.1 Assessment tools developed (by 9 MAPSD - NG POPs Program Coordinator, State EPA Offices)

9.4.1.2 Conduct state level training workshop on use of assessment tool (by 12 MAPSD - NG POPs Program Coordinator, State EPA Offices)

9.4.1.3 Conduct assessment in relevant state and national agencies, information submitted to NG POPs Program Coordinator for compilation and analysis (by 15 MAPSD – Various Agency Offices, NG POPs Program Coordinator, EPA Offices)

9.4.1.4 Analysis complete and "POPs Training Needs" report (by 18 MAPSD – NG POPs Program Coordinator, EPA Offices, NHSEWG)

Performance Indicator(s): Satisfactory progress with assessment tools developed, training provided, and analysis report produced.

Resources Needs (1 – 12 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
State "Assessment Tools" Training Workshops (2,000/state).....$8,000
Travel – NG POPs Program Coordinator, - Kosrae, Chuuk, Yap 6,000

Total $14,000

Resources Needs (13 – 24 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget

Objective #9.4.1Total.....$14,000

Objective 9.4.2: By 24 MAPSD, systematic training programs will be initiated for and/or by all relevant agencies to ensure full and sustainable management, monitoring and researching on POPs.

List of Activities/Time Frame/Responsible Parties:

9.4.2.1 Using information collected in Objective #9.4.1, research types of short-term in-country training methods most appropriate to meet identified needs (by 21 MAPSD - NG POPs Program Coordinator, State EPA Offices)

9.4.2.2 Arrange and conduct systematic training programs (by 24 MAPSD and on-going - NG POPs Program Coordinator, State EPA Offices)

Performance Indicator(s): Satisfactory progress with identifying type of trainings and conducting training sessions.

Resources Needs (13 – 24 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Costs of training sessions (est. avg. $20,000 per year per state) $80,000

Total $80,000

Resources Needs (25 – 36 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Costs of training sessions (est. avg. $20,000 per year per state) $80,000

Total $80,000

Resources Needs (37 – 48 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Costs of training sessions (est. avg. $20,000 per year per state) $80,000

Total $80,000

Objective #9.4.2 Total.....$240,000

Objective 9.4.3: By 24 MAPSD, the relevant agencies will have launched a scholarship program to financially support one undergraduate/graduate/post-graduate student per state to promote in-country expertise on POPs.

List of Activities/Time Frame/Responsible Parties:

9.4.3.1 Using information collected in Objective #9.4.1, research types of formal college/university programs most appropriate to meet identified needs, contact institutions to arrange admission, and determine student selections criteria and process (by 21 MAPSD - NG POPs Program Coordinator, State EPA Offices)

9.4.3.2 Announce POPs Scholarship availability, select recipients, arrange programs (by 24 MAPSD and on-going - NG POPs Program Coordinator)

Performance Indicator(s): Satisfactory progress with identifying post-secondary institutions, arranging admissions and selecting students.

Resources Needs (13 – 24 MAPSD):
State POPs Program/EPA Office remuneration..... in State Cross-Project Budget

Resources Needs (25 – 36 MAPSD):
Costs of scholarships ($25,000 x 4).....$100,000

Total $100,000

Resources Needs (37 – 48 MAPSD):
Costs of scholarships ($25,000 x 4).....$100,000

Total $100,000

Objective #9.4.3 Total.....$200,000

Objective 9.4.4: Beginning 25 MAPSD, a POPs Fellowship Exchange Program will be launched and conducted on a rotational participation per State by at least one line agency to participate in a peer/regional cross-training.

List of Activities/Time Frame/Responsible Parties:

9.4.4.1 Using information collected in Objective #9.4.1, contact other Pacific Islands nation's POPs programs to determine most appropriate host venue for Fellowship, determine terms of reference for the Fellowship program, selection of FSM candidate, and arrange for travel and accommodations in host country (by 24 MAPSD - NG POPs Program Coordinator, State EPA Offices)

Performance Indicator(s): Satisfactory progress with identifying Fellowship venue, developing TOR, selecting candidate arranging logistics.

Resources Needs (13 – 24 MAPSD):
No costs incurred

Resources Needs (25 – 36 MAPSD):
Costs of travel ($5000), accommodations ($1500/mo), stipend ($500/mo) .$29,000

Total $29,000

Resources Needs (37 – 48 MAPSD):
Costs of travel ($5000), accommodations ($1500/mo), stipend ($500/mo) .$29,000

Total $29,000

Objective #9.4.4 Total.....$58,000

Objective 9.4.5: Beginning by 24 MAPSD, an annual National POPs Management Workshop will be conducted with full participation by all relevant agencies to enhance their technical capacities in POPs management. This workshop will be held in conjunction with the annual NHSEWG Working Meeting (tentatively scheduled for August).

List of Activities/Time Frame/Responsible Parties:

9.4.5.1 Using information collected in Objective #9.4.1, POPs management topics to be addresses at the National POPs Management Workshop will be determined (by 15 MAPSD - NG POPs Program Coordinator, State EPA Offices, NHSEWG)

9.4.5.2 Workshop agenda and technical content presentations completed, consultant secured, other workshop logistics completed (by 18 MAPSD - NG POPs Program Coordinator, State EPA Offices, NHSEWG)

9.4.5.3 Workshop conducted (by 20 MAPSD - NG POPs Program Coordinator, Consultant, State EPA Offices, NHSEWG)

Repeated during the third and fourth years.

Performance Indicator(s): Satisfactory progress with identifying training topics, recruiting consultant, organizing and conduction workshop.

Resources Needs (13 – 24 MAPSD):

Consultant (0.5 months, facilitate workshop)	$8,000
POPs Management Workshop (Aug.: 5 days x 5/state)	25,500
Workshop/Training supplies	2,500
Total	$36,000

Resources Needs (25 – 36 MAPSD):

Consultant (0.5 months, facilitate workshop)	$8,000
POPs Management Workshop (Aug.: 5 days x 5/state)	25,500
Workshop/Training supplies	2,500
Total	$36,000

Resources Needs (37 – 48 MAPSD):

Consultant (0.5 months, facilitate workshop)	$8,000
POPs Management Workshop (Aug.: 5 days x 5/state)	25,500
Workshop/Training supplies	2,500
Total	$36,000

Objective #9.4.5 Total $108,000

Objective 9.4.6: By 24 MAPSD, all relevant agencies will systematically upgrade and develop their laboratory and equipment/test kits to be sustainable in POPs management. (Action Plans #2 and #3 address the procurement and maintenance of testing equipment for various POPs management activities. Objective 9.4.6 will focus on the improvement of laboratory capacity)

List of Activities/Time Frame/Responsible Parties:

9.4.6.1 Conduct assessment of in-county laboratory (EPA offices, hospitals, educational institutions) capacity in regards to the needs of POPs management and control, determine what POPs testing is cost-efficient to be performed in-country and which tests are best sent to external laboratories. (by 18 MAPSD – NG POPs Program Coordinator, EPA Offices)

9.4.6.2 Determine, based on information collected in Objective #9.4.6.1, what equipment should be procured, and obtain. (by 21 MAPSD - NG POPs Program Coordinator, State EPA Offices)

9.4.6.3 Determine, based on information collected in Objective #9.4.6.1, what laboratory technician training should be provided, and arrange. (by 21 MAPSD - NG POPs Program Coordinator, State EPA Offices)

Performance Indicator(s): Satisfactory progress with identifying laboratory needs, procuring equipment, conducting training.

Resources Needs (13 – 24 MAPSD):

State POPs Program/EPA Office remuneration..... in State Cross-Project Budget
Travel – NG POPs Program Coordinator, - Kosrae, Chuuk, Yap $6,000

Total $6,000

Resources Needs (25 – 36 MAPSD):

Laboratory Equipment Procurement (est. avg. $50,000/state) $200,000
Laboratory Technician Trainings (est. avg. $5,000/state) 20,000

Total $220,000

Resources Needs (37 – 48 MAPSD):

Laboratory Equipment Procurement (est. avg. $50,000/state) $200,000
Laboratory Technician Trainings (est. avg. $5,000/state) 20,000

Total $220,000

Objective #9.4.6 Total.....$446,000

Action Plan #7 - Total Budget $1,084,500

Annex 1 - Descriptions of the 12 POPs

Aldrin – A pesticide applied to soils to kill termites, grasshoppers, corn rootworm, and other insect pests.

Chlordane – Used extensively to control termites and as a broad-spectrum insecticide on a range of agricultural crops.

DDT – Perhaps the best known of the POPs, DDT was widely used during World War II to protect soldiers and civilians from malaria, typhus, and other diseases spread by insects. It continues to be applied against mosquitoes in several countries to control malaria.

Dieldrin – Used principally to control termites and textile pests, dieldrin has also been used to control insect-borne diseases and insects living in agricultural soils.

Dioxins – These chemicals are produced unintentionally due to incomplete combustion, as well as during the manufacture of certain pesticides and other chemicals. In addition, certain kinds of metal recycling and pulp and paper bleaching can release dioxins. Dioxins have also been found in automobile exhaust, tobacco smoke and wood and coal smoke.

Endrin – This insecticide is sprayed on the leaves of crops such as cotton and grains. It is also used to control mice, voles and other rodents.

Furans – These compounds are produced unintentionally from the same processes that release dioxins, and they are also found in commercial mixtures of PCBs.

Heptachlor – Primarily employed to kill soil insects and termites, heptachlor has also been used more widely to kill cotton insects, grasshoppers, other crop pests, and malaria-carrying mosquitoes.

Hexachlorobenzene (HCB) – HCB kills fungi that affect food crops. It is also released as a byproduct during the manufacture of certain chemicals and as a result of the processes that give rise to dioxins and furans.

Mirex – This insecticide is applied mainly to combat fire ants and other types of ants and termites. It has also been used as a fire retardant in plastics, rubber, and electrical goods.

Polychlorinated Biphenyls (PCBs) – These compounds are employed in industry as heat exchange fluids, in electric transformers and capacitors, and as additives in paint, carbonless copy paper, sealants and plastics.

Toxaphene – This insecticide, also called camphechlor, is applied to cotton, cereal grains, fruits, nuts, and vegetables. It has also been used to control ticks and mites in livestock.

Annex 2 - GEF POPs Project - List of Participants – FSM National POPs Coordinating Committee & four State POPs Task Forces

FSM National Coordinating Committee

Members	Organization
Mr. Eugene Pangelinan	FSM National Oceanic & Resource Management Authority
Mr. Phillip Joseph	FSM Dept. of Transportation, Communication and Infrastructure
Mr. Nick Donre	Conservation Society of Pohnpei
Mr. Robert Spegal	Pohnpei Waste Management Services
Mr. Jackson Soram	FSM Dept. of Foreign Affairs
Ms. Cindy Ehmes	FSM Dept. of Economic Affairs (Sustainable Development Unit)
Mr. Ishmael Lebehn	FSM Dept. of Economic Affairs (Agriculture Unit)
Mr. Okean Ehmes	FSM Dept. of Economic Affairs (National Biodiversity Project)
Ms. Janet Panuelo	Pohnpei Women's Club
Ms. Julie Liskenin	FSM Dept. of Justice
Mr. Spensin James	College of Micronesia - FSM
Mr. Moses Pretrick	FSM Dept. of Health, Education and Social Affairs

Kosrae State POPs Task Force

Members	Organization
Mr. Moses Palik	Project Coordinator – KIRMA
Mr. Larson Livaie	Admin. Officer - KIRMA
Mr. Thansley Kinere	Heavy Equipment Supervisor – Dept. of Public Works, Kosrae State
Mr. Norlin Livaei	Acting Chief Sanitarian – Dept. of Health Services
Mr. Nena G. Nena	Costumer Service Supervisor – Kosrae Utilities Authority

Pohnpei State POPs Task Force

Members	Organization
Mr. Albert Roby	Chairman, Pohnpei EPA
Mr. Kun Isaac	Vice Chairman, Dept of Education, Pohnpei State
Mr. Engly Ioanis	Secretary, COM Land Grant Office
Mr. Tony Bermanis	Member, Dept. of Social Affairs, Pohnpei State
Mr. Tony Acktouka	Member, Office of Transportation &Infrastructure, Pohnpei State
Mx. Simao Nanpei	Member, Dept of Health Services, Pohnpei State
Mr. Perez Ioanis	Member, Pohnpei EPA

Mr. Brendy Carl	Member, Pohnpei EPA
Ms. Donna Schuering	Member, Pohnpei EPA Consultant
Mr. Robert Spegal	Advisor, Pohnpei Waste Management Services

Chuuk State POPs Task Force

Members	Organization
Mr. Kind Kanto	Instructor, COM, Chuuk Branch
Mr. Freddy Elias	Supervisor, Power Division, Chuuk Public Utility Corporation
Mr. Ismael Mikel	Executive Director, Chuuk EPA
Mr. Joseph M. Konno	Advisor, Chuuk EPA
Ms. Mercy D. Sos	Environmental Specialist, Chuuk EPA

Yap State POPs Task Force

Members	Organization
Mr. Xavier Jibemai	Yap State POPs Coordinator, Pesticide and Hazardous Waste Program SpecialistYap State EPA
Mr. John Worswick	Pollution Control Specialist 2 - Yap State EPA
Mr. Charles Chieng	Yap CAP Director - Team member, representing NGO
Mr. Francis Falan	Power Plant Manager - Team member, representig Yap Utility Company (Yap State Public Service Corporation)
Mr. Aloysius Wag	Sanitarian - Team member, representing Yap Health Services, State Sanitation Office.

Annex 3 - State Descriptions

Kosrae State

Kosrae State is the easternmost state of the FSM (located at 5N and 165E), is the Federation's only single island state, and its roughly triangular shape covers about 42.3 square miles in area. It is a high island. The mountains are steep and rugged, reaching to approximately 2,060 feet, with a low coastal plain which is up to a mile wide in some areas and very narrow in others. The mountainous interior covers about 70 percent of the area, and more than half the island is covered with rainforest. Kosrae has no lagoon or barrier reef, but the island has a surrounding reef, from several hundred feet to as much as a half mile wide in some places. The island has many sandy beaches which alternate with mangrove swamps to fringe the coastline.

On Kosrae, rainfall is relatively consistently month-to-month throughout the year, with the wetter western (leeward) side of the island receiving about 250 inches per year, while the eastern (windward) side receives about 180 inches annually. Temperatures average 80 degrees (F) and humidity 80 percent year round. Kosrae is rarely affected by strong typhoons, however low lying coastal areas can experience flooding at times of the year with very high tides or during storms.

The island has five main villages, with the government offices, the hospital, the high school, and the Kosrae State campus of COM-FSM located in an area called Tofol. A road running parallel to the shoreline continues about 75 percent of the way around the island, and in 2002 reached the village of Walung, previously accessible only by foot or boat. The largest population center is on Lelu, a small island connected to the main island by a causeway. Built on the reef, on the opposite side of the island from Tofol, is Kosrae's international airport.

The government copies the U.S. style, three branches, but with a single legislative body. The population (2000 census) was 7,686 with Kosraeans comprising about 95 percent of the total. Other residents include people from the other FSM states, Caucasians, Filipinos, and other Asians The median age is 19.2, with persons over 65 making up nearly 5.5 percent of the total population. The population of working age (15-65 years) is 4,628, or about 60 percent of the total. The census indicated that women make up about 28 percent of the persons who are formally employed, and that the unemployment rate is about 16.5 percent. The median family income is about $8,017.

The average population density is 182 persons per square mile, and the most densely populated area is Lelu at 312. Perhaps 60-70 percent of Kosraeans live in a village setting which could be considered "urban," relative to those living beyond the village centers where houses are more scattered and isolated. Languages used include Kosraean and English.

All Kosraean households report having electrical power, 97.6 percent have piped water, but about 73 percent use a water catchment for drinking water. The census reported that 72 percent of housing units have sewer connections or a septic tank. About 48 percent of households cook outside and methods include kerosene stoves, electric ranges, and wood fueled fires.

Kosrae has a free public school system, with an elementary school in each village, one public high school, one private school, and the COM-FSM Kosrae Campus. The literacy rate is 99+ percent. Of persons over 25 years of age, about 14.1 percent of the population has a high school

level education, while nearly 13.8 percent has earned an A.A./A.S. degree, and 4.7 percent a BA or BS degree.

The health system includes the Kosrae State Hospital, Public/Preventative Health Services, and outreach clinics at community centers and schools. The crude birth rate in Kosrae calculated from the 2000 census is 28.5, and the life expectancy is 66.1 years. Major causes of death among Kosraeans are Hypertension/Heart Disease and Diabetes related complications.

Pohnpei State

The State of Pohnpei includes outer island groups, plus Pohnpei which is a high island with an area of 129 square miles, the largest land mass in the country. Its location is 158 degrees east longitude and seven degrees north latitude. A drive around the island takes about three hours on the circumferential road. The roughly pentagonal shaped island has central mountains with a peak elevation of nearly 2,600 feet, and wide coastal areas with rolling hills.

Rain forests and tropical savannas cover most of the land. Mangrove swamps fringe most of the coastline, with beaches only found on the barrier reef. Pohnpei island is surrounded by a large lagoon (279 sq. mi.), which has many reef flats, sheltered by the barrier reef. The state includes seven inhabited outer atolls. The nearest, Pakin, is located less than 20 miles away, and the farthest, Kapingamarangi, is 410 miles distant. The total land mass of all atolls is just over three square miles, with no area more than a few yards above sea level. Atoll vegetation is limited due to porous poor soil, high salinity in the ground water, and ocean spray.

Measurable rain falls on an average of 300 days per year, with Kolonia averaging 194 inches per year, and the interior of the island receiving 350-400 inches annually. The driest (or least wet) months are January and February, with 11+ inches of rain on average. Temperature is constant throughout the year, with mean highs in the upper 80's during the day and mean lows in the mid 70's at night. Humidity averages 80-85 percent year round. Although Pohnpei is located within the spawning ground of typhoons, most of these storms depart the area prior to reaching destructive strengths. The most destructive typhoon on record occurred in 1905. Outer atolls are susceptible to drought, as is the main island during El-Nino weather conditions.

The main town and site of the state government offices and airport is Kolonia Town. The offices of the FSM national government and the national campus of the College of Micronesia-FSM are located in an area named Palikir, on the western side of the island about eight miles from Kolonia. In addition to Kolonia, Pohnpei island is divided into five municipalities which correspond to ancient traditional kingdoms. Today, for legislative purposes, the five largest outer atolls are each also considered a municipality. The State Government is organized on the U.S. style, three branch, but with a single legislative body.

The state's population in the 2000 census was 34,486, including 95 percent Pohnpeians and the balance being citizens from the other FSM states, Caucasians, Filipinos, Japanese, Palauans, Marshallese, Koreans, and Chinese. The median age 18.9 years, and 4.9 percent of the population is over 60 years of age. About 7 percent of the population lives on the outer atolls. The portion of the population living within the boundaries of the "urban" center of Kolonia was about 17 percent in 2000 and has been slowly declining as the improved (paved) road system expands. Population density for Pohnpei Island is 249 persons per square mile. Kolonia Town's density is 9,795 and the outer atolls range from 369 to 1,279 persons per square mile.

Languages spoken include Pohnpeian, English, and a Polynesian language. A number of the elderly in each of the FSM states remember and can speak Japanese. Pohnpei has a free public school system with an elementary school in each village, and public junior and senior high schools. Several private schools operate in the state, including elementary and high schools. COM-FSM operate the National Campus and the Pohnpei Campus in the state. The state's literacy rate is about 96 percent. For persons 25 years and older, 12.5 percent have completed high school, 7.8 percent have earned an A.A./A.S. degree, and 3.7 percent a Bachelors degree.

The population of working age persons in 2000 numbered 20,468, and of the 11,816 persons employed, 33.2 percent were women. The unemployment rate was 12.3 percent, and the median family income was $6,691. Households having electrical power comprise about 68 percent of the total, those with piped water 70 percent, while 22 percent use a water catchment for drinking water. Approximately 31 percent of housing units have sewer connections or a septic tank. Cooking is done outside in 53 percent of households and methods of cooking include kerosene stoves, electric ranges, and wood fueled fires.

The state health system includes Pohnpei State Hospital, a primary/public health care division, and dispensaries on the main island and one in each outer island group. Diagnosis and treatment services are provided by surgeons, obstetricians/gynecologists, and internists. There are also four private physicians and one dental clinic on island. The birth rate was 30.3 in 2000 and the life expectancy was 67.4 years. During the years 1998 to 2002, a total of 532 patients were referred for off-island care, with 42 (7.9 percent) for cancer or suspected cancer. Lifestyle-related health conditions are also on the rise.

Chuuk State

Weno is the main island in Chuuk State (152E, 7N) and is the site of the state government offices, the hospital, secondary and post-secondary educational institutions, many of the commercial businesses, and the airport. A road runs the length of Weno following the western coastline. The island is located near the center of one of the world's largest lagoons (823 sq. mi.) along with 14 other high islands, which all combined total under 39 square miles in area. Chuuk State also includes six other groups of outer atolls, totalling 10.6 square miles, located at varying distances (the farthest over 200 miles) to the southeast, west, northwest, and north. In total, the state has over 100 islands (43 inhabited) spread over more than 180,000 square miles of ocean. Vegetation on the high islands and atolls is similar to Pohnpei State. The number of inhabited islands, a few with less than 200 residents, along with the relative isolation of some of the atolls, makes the provision of comprehensive and quality social services to all of the state's citizens a daunting logistical challenge.

The state government set up is also based on the US style, three branch, with bicameral legislative body.

The Chuuk State resident population recorded in the 2000 census was 53,595, Chuukese comprising 98 percent, with other FSM citizens, Caucasians, Filipino, Japanese, and other Asians filling the balance. The median age of the population is 18.5 years and the segment over 65 years is 3.6 percent. About 26 percent of the state's population lives on Weno, which could be considered the state's most urban type area with paved roads and commercial outlets. However, all of the islands and atolls in Chuuk have population densities of over 1,000 persons

per square mile, 1,018 in the central lagoon area and 1,194 in the outer islands. The population 15 to 65 years of age totals 31,587 of which 18,192 are employed. Women comprise about 28.3 percent of the working population. The unemployment rate is 34.2 percent.

Languages spoken in Chuuk include Chuukese, outer island languages (some of which are dialects), and English. There is a free public school system with elementary schools in several villages on Weno, on the main lagoon islands, and on each atoll's main island(s). A public high school is located on Weno, along with several private schools, and the Chuuk Campus of COM-FSM. The state's literacy rate is 89.3 percent. Of people over 25, 11.1 percent are high school graduates, 4.4 percent have Associate degrees, and 2.8 percent Bachelor degrees.

The state's health system includes Chuuk State Hospital, a public health division, and dispensaries on larger outer islands. The crude birth rate recorded in 2000 was 27.5 and life expectancy is 66.2 years.

The median family income is $2,951. Households having electrical power comprise 32.6 percent of the total, piped water 24.8 percent, and 82.5 percent use a water catchment as their source of drinking water. Just over 13 percent of housing units have sewer connections or a septic tank. Cooking is done outside at 80 percent of the homes, and methods include wood fuel, kerosene stoves, and electric ranges.

Yap State

Yap State consists of Yap "proper," just over 40 square miles in area (actually made up of smaller islands with narrow channels separating them), and 12 groups of outer atolls, the most distant more than 500 miles towards the east. Presently 22 of the 78 atoll islets and island are inhabited. Due to population pressures, families sometimes migrate to or from atoll islets, thus altering the number of inhabited locales. Ulithi and Woleai have the two largest land areas, with populations large enough to warrant establishment of high schools and power generation plants. The state covers an area of approximately 500,000 sq. mi. of ocean, from six to ten degrees North and 137 to 148 degrees West.

Yap proper is relatively flat on the southern half (the location of the airport), with rolling hills and low mountains in the north, and is surrounded by a lagoon of about 405 square miles in area, enclosed in a barrier reef. A road system stretches from the state's administrative and commercial center of Colonia to most of the villages. The State government set up is a U.S. style three branch system. Councils of traditional chiefs, from Yap proper and the outer islands, play an influential role in the politics of the state. Two garment factories in Yap employ over 400 mostly Taiwanese workers. However at the time of this report, indications that both plants will be closing soon are being noted.

Daytime temperatures on Yap are typically in the 80's, with high humidity (85+ percent). Trade winds vary in direction by season and the island has distinct wet (July to November) and dry seasons during the year. Yap proper and the outer atolls experience extended dry periods from time to time, causing significant water shortages in some communities.

The resident population counted in the 2000 census totalled 11,241 persons. Yapese made up 95 percent of residents. Other groups included Asians, citizens of other FSM states, Palauans, Caucasians, and Filipinos. Median age is 20.9 years, and the portion of the population over 65 years is 4.6 percent. About 65.8 percent of the population lives on Yap proper and 34.2 percent

on the outer islands. Densities are 190 persons per square mile on Yap proper, and up to 550 on the outer islands and atolls. The labor force numbers 7,153 of which 4,964 are employed. Over 41 percent of persons involved in formal work were women. The unemployment rate is 4.1 percent.

Languages spoken are Yapese, two outer island languages, Chinese, English, Taiwanese, and Japanese. A free public school system exists with an elementary school in each village, three high schools, two private schools, and the COM-FSM Yap campus. The state's literacy rate is 92.3 percent. Of persons over 25 years of age, about 30.3 percent have completed a high school level education, while nearly 10.2 percent have earned an A.A. or A.S. degree, and 3.8 percent a B.A. or B.S. degree.

The median family income is $6,860. Households having electrical power constitute 58.5 percent of the total, piped water 53.2 percent, and 58.4 percent use a water catchment for drinking water. 23.8 percent of housing units have sewer connections or a septic tank. Cooking is done outside in 75 percent of the households with wood fuel, kerosene stoves, and electric ranges employed.

The health system includes one hospital on Yap proper, a public health division, and a total of 18 dispensaries on the outer islands, with staff trained in health education/primary care. The crude birth rate in 2000 was 24.3 and life expectancy was 71.6 years. From 1999-2002, a total of 25 cancer patients were referred.

Annex 4 - Draft Public Awareness Messages

POPs Awareness Message #1 - What are Persistent Organic Pollutants (POPs) and why are they a problem for the people living in the Federated States of Micronesia?

Persistent Organic Pollutants, often referred to as "POPs", are twelve of the most toxic (poisonous) chemicals which have been determined by science and medical experts at the United Nations (UN) to be a significant public health hazard on a world-wide scale. These twelve chemicals are linked to a variety of health problems in both humans and animals, including: cancers and tumors, cardiovascular (heart) disease, diabetes, infertility (inability to have children), birth defects, learning disorders, and a weakening of the immune system (which makes it easier for a person to become ill and harder to get better). By the word "linked" scientists mean that, in some cases it is definitely proven that some of these chemicals are the causes of certain diseases, and in some cases, it is believed that the disease is caused by a certain chemical, but it has not yet been definitively proven. Terms with a similar meaning to "linked" are "associated with" and "related to". Because it may take only a very, very small amount of a POPs chemical to make a person sick, and the sickness may not appear until years after the chemical has entered a person's body, sometimes it is very difficult for scientists and doctors to be absolutely certain that a specific POPs chemical is the cause of a specific symptom or disease.

Almost all of these POPs chemicals are man-made, but two are the unintentional by-products of combustion (burning) and other industrial processes. Today, POPs are found everywhere and in every living thing. They are present in the Earth's environment (in the air, the water, and the soil) and in every living person and many animals. There are actually thousands of these man-made chemical substances in existence today, and many of them are essential to the standard of living that many people in the modern world enjoy. These chemical substances are found in many of the products that we use everyday, and the vast majority of them are believed to be completely safe. However, scientists have determined that a few of these substances are extremely dangerous to human health and the environment. The use of these dangerous POPs chemicals needs to be reduced, and eventually discontinued.

Some of the POPs substances were first created in the early 1900's and have been in use for nearly 80 years. But the disturbing information about some of the POPs chemicals being unsafe is relatively new. Twenty to thirty years ago it was not known that some of these chemicals were so dangerous to human health, the health of animals, or the environment. The information about the movement of these POPs chemicals in the environment, their long-lasting nature, and that very tiny levels of exposure were very dangerous, was not understood at all. However, as the information about different groups of people who developed cancers and other diseases, started to be analyzed, the doctors and scientists began to suspect that certain chemicals were causing the health problems. One of the best known examples of groups of people who became sick because of POPs substances were the soldiers who fought in the Vietnam War and who were exposed to "Agent Orange", a substance used to defoliate (remove leaves from the trees) the jungle

to prevent enemy soldiers from having places to hide. After returning home, many of these soldiers suffered from various illnesses as a result of their exposure. Another example of people who became sick because of POPs substances were those families who lived in neighborhoods where a substance called DDT was sprayed to eliminate mosquitoes and other insects. The nervous systems of people in these areas was affected by the chemicals, causing excitability, tremors, and seizures. Women had increased changes of having a premature baby, and their breast-milk dried up after an unusually short period of time and while their babies were still nursing. Agent Orange and DDT contain POPs chemicals.

The twelve POPs chemicals are: 1) aldrin, 2) chlordane, 3) DDT (dichlorodiphenyltrichlorethane), 4) dieldrin, 5) endrin, 6) heptachlor, 7) mirex, 8) toxaphene, 9) HCB [hexachlorobenzene], 10) PCBs [polychlorinated biphenyls], 11) dioxins, and 12) furans. The first eight POPs are pesticides, which were first developed to kill the insects and other pests which destroy crops. It is now known that these chemicals can also kill humans. HCB is also a pesticide, and both HCB and PCB's are chemicals that were used in industry. PCB's are found in electrical equipment and in transformers manufactured in the United States, and other countries, from the 1950's to the 1980's. It was during the late 1970's that the dangers of PCB's were discovered and their use was then discontinued. Many transformers with PCB's in them were installed and have been in use on many Pacific islands, including some of the islands in the FSM. Dioxins and furans are by-products released from incomplete burning. Household, municipal, and agricultural burning and internal combustion engines (the motors of cars and trucks) are some of the biggest causes of these dioxins and furans in the Pacific region.

If some of these names sound scary or dangerous, they should! These are some of the most poisonous substances in existence! This is why, in Stockholm (the capital city of Sweden) on 22 May 2001, at a meeting of world experts on the problems of pollution, a treaty was adopted. The specific goal of this treaty was to protect human health and the environment from POPs. The treaty, referred to as the Stockholm Convention, aims to eliminate the production and use of POPs, to minimize and ultimately eliminate the release into the environment of unintentional POPs, and to manage in an environmentally safe manner, all existing materials that are contaminated with POPs.

By 22 May 2002, 151 countries, including the Federated State of Micronesia, had signed the treaty. In the entire history of the UN, more than 50 years, this was the shortest time in which so many nations had ever signed a UN convention. By May 17, 2004 the Stockholm Convention had been ratified by 50 countries, France being the fiftieth signer. At this point the Convention entered into force. The FSM National Government ratified the Stockholm Convention in May 2005. The great importance of the POPs problem is reflected in the serious attention given to the Convention by all of the signing nations.

The dangers of POPs threaten people all around the world, in every country. These dangers do not stop at international or regional boundaries. Therefore, the only way to eliminate the danger of POPs is with the full cooperation of every country. The Stockholm Convention establishes an entity called the Inter-Governmental Negotiating Committee (or INC). This committee works to encourage and pursue good teamwork

among all nations. The POPs situation is a case of everyone benefiting if everyone participates, and of everyone losing out if only a few do not participate.

POPs Awareness Message #2 - A Very Brief History of Toxic Exposure and What the Stockholm Convention Can Do

Long before the world had ever heard of Persistent Organic Pollutants (POPs) people were suffering disease and death from exposure to hazardous substances. In most cases the victims had no idea what was causing the poor health outcomes. In the 4th century B.C., Hippocrates (the Greek physician who is honored as the Father of Medicine) identified a case of lead poisoning, one of the first occasions when a substance in use by the general public was discovered to have a harmful effect on an individual's health.

Many historians believe that one of the major contributing factors to the decline and fall of the Roman Empire in the 4th and 5th centuries A.D. was also lead poisoning. The upper classes of Roman society consumed massive amounts of lead on a daily basis, both in the food that was eaten and the wine and water that was drank. Lead was used in pewter plates, cups, pans, and even as a food seasoning! It was added to wine and since Roman cities used pipes made of lead, (the word "plumbing" comes from the Latin word for lead), everyone who drank the water was further exposed. Historical records from those times describes many cases of mad behavior among the aristocrats, including the infamous Emperor Nero who played music while the city of Rome burned. Upper class women frequently had miscarriages, stillbirths, and gave birth to children with severe mental health problems. Citizens of the lower classes, unable to afford the lead-tainted luxuries, did not experience the same high rates of lead-poisoning related health problems.

In the late 18th Century, Sir Percivall Pott linked the high rate of cancer among chimney sweeps to the soot to which they were exposed on a daily basis. During their working hours, sweeps performed their jobs in small, poorly ventilated places, and were exposed to soot by both skin and contact and respiration. This was one of the first accounts of an occupational exposure to a hazardous substance to be associated with cancer.

These examples, and countless others in more recent times, are an indication of the seriousness of today's POPs situation. The insidious, or gradual, build-up of POPs substances in an individual's body from low level exposures that are never recognized (by breathing air, eating food, and drinking water), justify the increase of global concern to address this public health threat. This is why the Stockholm Convention is so important.

The Convention has five major goals. The first is to eliminate dangerous POPs, starting with the twelve worst. The production and use of endrin and toxaphene will be totally banned. The production of aldrin, dieldrin and heptachlor, will be banned, but member countries can use up remaining supplies if the use is in compliance with certain conditions. The production and use of chlordane, hexachlorobenzene, and mirex will be limited to specific purposes and only by countries which have registered for exemption to produce and use. The production of PCBs will be banned and countries will have until 2025 to replace all equipment containing PCBs. The production of DDT will be

restricted and the use of DDT limited only to controlling disease vectors, such as mosquitoes. Governments are required to take steps to reduce the release of dioxins, furans, hexachlorobenzene, and PCBs. Finally, imports and exports of the man-made POPs will be restricted.

Countries which have ratified the Conventions will be required to develop national plans for implementing the Convention. These plans are to be completed within two years following ratification.

The second component of the Convention is aimed as supporting the transition to safer alternative substances. The production and use of DDT will be permitted only in accordance with World Health Organization (WHO) guidelines and other conditions. Every three years an assessment will be undertaken to evaluate the current uses and determine if alternatives are available. The year 2025 is set as the year when all PCB containing equipment must be removed from use. Member countries will be permitted to apply for exemptions to produce and use certain POPs substances. Exemptions will expire in five years and a new request will then be needed. Convention member nations will review each request and can reject a request if not justified. At the time when no more requests for exemption are submitted, the exemption will be discontinued. Governments are to develop plans to promote the use of the best available technologies and the best environmental practices.

Aim number three of the Convention is to target additional POPs for action. A "precautionary approach" is to be employed. If there is the threat of serious or irreversible damage, the lack of full scientific scrutiny will not be used as a reason for delaying action. The Convention establishes a POPs Review Committee that will meet regularly to consider additional substances to be added to the POPs list. The financially and technologically rich countries are called upon by the Convention to help other less fortunate countries to find acceptable alternatives to POPs.

The fourth goal of the Convention is to clean-up old stockpiles and equipment containing POPs. Government are requested to develop and implement strategies to identify any products or items containing POPs, and then to manage these items in an environmentally sound manner. The handling, collection, transportation, and storage of POPs contaminated materials must be done safely. The Convention seeks financial aid to assist the poorer countries to properly complete these tasks.

The fifth and final part of the Stockholm Convention seeks cooperation among nations to work together towards a POPs-free future. The Convention seeks to increase public awareness through the provision of accurate and up-to-date information, educational programs, and other activities that will create widespread understanding of the problems of POPs. The long range objective is to prevent future problems with POPs. Governments must make regular reports on the progress being made to implement the treaty, and share success stories and explanations for failures. A clearing house of information for governments and businesses is to be established, and all governments with the capacity are encouraged to support research into the POPs issues and provide technical and financial assistance to poorer nations.

POPs Awareness Message #3 - What does "POPs" mean?

The acronym "POP" stands for Persistent Organic Pollutant. This name is a good one because it describes the three most important characteristics shared by all of these twelve dangerous chemicals. The word "Persistent" is defined as "long lasting, continuing to exist or endure". POPs chemicals deteriorate or decay very slowly and some of these chemicals can last in the environment for many years or even decades. They also can remain in the tissues of plants and animals (including humans) for a long time, years and years.

The rate at which a substance decays is called its "half-life". For example, a half-life is the time it takes for one gram of a substance to decay until only one-half gram remains. It is estimated that the half-life of some POPs substances in the human body is seven years. What this means to you is this. If you ate food contaminated with a POPs chemical, or drank POPs contaminated water, or breathed contaminated air seven years ago, half of the amount that entered your body then, is still in you now! And if your exposure to the source of POPs has continued during those seven years, your levels have not decreased, but have increased. Workplace exposure and smoke from Saturday year clean-up fires are examples of repetitive exposures that would increase POPs levels. The same is the case for children at a school where the trashed is burned every week, year after year, in a drum outside the classroom.

Because they are so persistent, POPs chemicals are able to travel long distances by air or water. POPs initially released to air (as might happen at a factory smokestack, an electric power plant, a burning dump, or a burning drum) are carried by the wind and by ocean currents around the earth. Polluted air affects urban populations as well as the environment, and the people living in the downwind direction. Contaminated dirt that is washed into a stream by a rainstorm pollutes the river. Polluted water, used for irrigation, contaminates the soil. POPs chemicals are now a truly global problem, as they have been transported everywhere on earth, by the forces of nature and human activity. The Stockholm Convention is a result of the realization by the nations of the world, that no place on earth can escape this problem, and that the situation will only continue to get worse and more people will get sick and die, unless all nations cooperate to solve this problem.

"Organic" is a chemistry term. Chemicals that have carbon as one of their elements are usually referred to as organic chemicals. Since living things are all based on the carbon element, all animals and plants, that is all living things, can be referred to as "organic". A metal like aluminium or iron, a rock of granite or basalt, or a piece of glass are all referred to as "inorganic" or not living. POPs substances are called "organic" because they contain carbon. POPs chemicals are able to enter into the body of a person or animal, or into the cells of a plant. A POPs contaminated plant that is eaten by an animal will transfer its POPs chemicals to the tissues of the animal. They can then move farther up the food chain when an animal with POPs in its fatty tissue, is eaten by another animal. The longer living animals at the top of the food chain, including dairy animals and fish, are able accumulate high concentrations, as they continue to consume more and more things which are contaminated with POPs. Being at the very top of the food chain, humans can accumulate the highest concentrations, and suffer the health consequences.

Animals also suffer from similar POPs related health problems. The organic nature of POPs substances means that they can also be transferred from mother to offspring during pregnancy or while breastfeeding.

Almost everyone knows what the word "Pollution" means, and a "Pollutant" is something that causes pollution. When air, or water, or soil, or food is polluted, it is no longer clean, it has been contaminated and is no longer safe to use. Pollution has been a problem for mankind for centuries, but it was a much simpler problem in the past. There are two main reasons that pollution is now a major problem for all of the Earth's population. First, there are more people living on this planet than ever before, more than six billion (6,446,000,000 is the 2005 estimate). People create waste as a part of daily living, and as the number of people increases, so does the amount of waste produced. In the more developed countries, on average one person may create more than one-third of a kilogram per day.

The second reason is that there are many more man-made items being produced than ever before. In Biblical times there were very few pollutants created that could damage the environment or make people sick. In 2005, there are hundreds of thousands of products manufactured in factories located all over the world. These products are shipped to every place on Earth where there are people living, from the big cities to the small atolls. Almost all of the manufactured goods that are in use today also are wrapped or contained in some kind of packaging, thus adding even more products to the list of potential pollutants. Some of the items are poisonous in and of themselves (like pesticides, cleaning agents, and fuels). Some items, when discarded and burned create a toxic smoke containing POPs substances. In many cases, the actual manufacturing processes that create all of these goods, add additional dangerous substances, including POPs chemicals, to the environment.

In the Federated States of Micronesia, according to estimates based upon the 2000 census, there are now as many as 110,000 people living in this island country. The census conducted by the Japanese administration in 1920, indicated that a total of 29,660 persons lived in the area that is now known as the FSM, approximately one-fourth of today's total. The waste generated by the 1920 residents was almost entirely biodegradable, such as peels, bones, husks, leaves, branches, tree trunks, and other wood materials. There were a few imports in cans and glass, but no plastics or styrofoam, or second-hand automobiles and cheap washing machines. Today, each resident of the FSM creates more waste, and much more waste on a per capita basis is produced, if one also considers all of the non-household waste from stores, restaurants, auto repair shops, etc. Much of it is not biodegradable, and thus is a potential source of pollution, and perhaps POPs chemicals if burned. And the total volume is now four times as much since there are nearly four times as many people creating waste. Also, today your neighbor lives closer to you, and the smoke from his trash fire might be blowing into your house. More people and more dangerous substances are the reasons that POPs are now a local problem, as well as a global problem.

To summarize: POPs do not decay quickly and can remain in the environment (in the air, water, and soil for long periods of time. They accumulate in fatty tissues and they can be passed up the food chain achieving higher concentrations at each level. POPs are mobile and are distributed world-wide by air and water, and POPs from other parts of the world

may show up in the air, water, soil, or food stuffs in the FSM. POPs are toxic, or poisonous, and can cause people to become sick and die.

POPs Awareness Message #4 - How Persistent Organic Pollutants Get Into Your Body?

Persistent Organic Pollutants (or POPs) enter the body when someone is exposed to a substance that is contaminated with them. Exposure means that you may be breathing air that has POPs chemicals or substances in it. Or, you may eat or drink something that has POPs in it. Or, you may touch something that is contaminated with POPs and they are absorbed through your skin. POPs in smoke or dust can also be absorbed through the skin. POPs are composed of molecules of different chemicals and have various physical characteristics. Some are a crystal (sand like) or powder form, or may be a solid block or have a waxy consistency. Some are liquids, and some can be in a gaseous form. Some are odorless, others have odors similar to turpentine, camphor (moth balls), or a mild chemical smell. POPs colors range from colorless, to while, yellow, amber, tan, and dark brown. The average person would probably not recognize a POPs substance without first receiving some training on identification techniques.

A very important aspect of knowing how a person can be exposed to POPs is understanding that sometimes only a very, very small amount is necessary to make a person sick, and toxic levels for some POPs are measured in *parts per billion* or *trillion* or even *quadrillion.* It is difficult to comprehend what kind of measurement we are talking about, but scientists now have the capability to measure these extremely tiny amounts. An example of *parts per billion* would be one (1) hair out of ten thousand (10,000) heads. The terrifying point of this entire discussion is that for some POPs these very tiny amounts can cause a person to get sick. This means that if you inhale a trillion (1,000,000,000,000) molecules of air, and there are some POPs molecules in it, a danger may be present. Since chemicals containing POPs have been in use for many years, and in some cases many decades, these POPs are now spread throughout the world. As more POPs enter your body, the risk of a POPs related illness may increase. This is not to say that everyone should walk around wearing gas masks, but smoke from a burning pile of rubbish should be avoided.

There are five "exposure pathways" to POPs. Exposure pathways are the ways that POPs can get close to, and then into your body. Almost all POPs substances are man-made, but some are found in the natural environment. Dioxins and furans are created in volcanoes and forest fires and then can be transported by the wind to far distant locations. Although a person may not realize it, he or she may be breathing air that contains these POPs that originated thousands of miles away. In the FSM, people are often exposed to POPs that come from nearby sources: cooking fires, fires started to clean land, or fires to burn trash.

Some POPs are found in a "built up" environment, such as in a large city. Smoke and dust can contain POPs and all of the exhaust from cars, buses, and trucks contain POPs. People living in cities with "smog" often have POPs related illnesses in addition to the respiratory problems caused by polluted air. Residents of Pacific islands and atolls are fortunate that smog is not a problem due to the breezes that blow past almost every day. However, people who live downwind from place like electrical power plants, or burning

municipal dumps, are at increased risk. Fuel burning vehicles with engines that are not properly "tuned up" and which blow a lot of smoke from the exhaust system, are adding POPs to the environment. Even on a Pacific island, if you live on a hill by a road, your POPs exposure may be increased by these poorly maintained vehicles.

A third pathway for exposure is occupational, or on-the-job. Many people throughout the world are employed in factories or other industries where POPs are produced, either intentionally or unintentionally. This situation is improving since many of the POPs are no longer produced for commercial use. However, workers at solid waste dumps, cement manufacturing plants, lumber and paper mills, and factories that use fire as part of the manufacturing process can be exposed to POPs. Exposure can be minimized or eliminated by using protective clothing and safety equipment.

The fourth pathway for exposure happens when people use products that have POPs in them. These products include pesticides and insecticides, wood preservatives, cleaning solvents, materials that have been treated with a flame retardant, and various other chemical products. The good news is that most of the manufacturers of these products, located in the United States and Europe, have now found safer alternative chemicals to use and the products no longer contain POPs. When purchasing items not manufactured in the US or Europe, check the labels. If you find POPs, report the product to your local EPA office.

The fifth exposure pathway is through diet, consuming foods that contain POPs. This is one of the pathways that everyone must be careful about. Since POPs have spread all over the world, it is very difficult to completely avoid them in the food that we eat. A survey in New Zealand found that as people get older, the accumulation of POPs increases in their bodies. This is true for everybody, but people do not get sick unless the accumulation gets too high and exceeds a safe level. The meat from a cow or sheep that eats grass that is contaminated will be contaminated, too. Fortunately, the countries that export these meats to the FSM have regulations in place to safeguard the quality of their products. Fish are also a potential source of POPs, particularly if they have been swimming in polluted waters. Exposure can be minimized by washing all produce to make sure that any pesticide residue is removed, and by proper handling of food during preparation and cooking.

The more that a person is exposed to POPs the greater the risk of sickness due to these chemicals. An important fact to remember is that POPs are persistent, they remain in your body for a long time, decaying very, very slowly. POPs can be transferred to the unborn baby from the mother, posing a danger to the health of the baby. If your house often receives smoke from cooking fires, from trash fires, or other sources, it is important that you do something to eliminate this threat to your and your family's health. The burning of tires also creates dangerous POPs chemicals in the smoke.

POPs Awareness Message #5 - Are Persistent Organic Pollutants a Serious Threat to My Health?

The several diseases that are associated with the various Persistent Organic Pollutants (POPs) can all cause serious health problems that contribute their share to the financial

and service burdens on the health care systems and cause grief for the families of sickened individuals. Some of the health risks related to POPs include increased incidence of multiple cancers and tumors, fertility problems, birth defects in babies, learning disorders, and a weakening of the immune system which makes a person more susceptible to many types of diseases.

Fortunately for the residents of the FSM's many islands and atolls, the POPs doses to which most Pacific Islanders are exposed, are much lower than the amounts that people in the US, European nations, and other larger countries take in. The FSM's islands support smaller populations than the continents, with far less heavy industry and fewer, smaller urban areas. This helps to keep exposures to many of the POPs and other hazardous substances at relatively low levels.

However, due to the ability of POPs substances to last for very long times and to travel very long distances, the POPs chemicals that were released into the environment many years ago and thousands of miles distant, may right now be negatively affecting the health of populations living on any of the FSM's main islands of Kosrae, Pohnpei, Chuuk, or Yap, and they will even be found on the most distant of the outer atolls of the country. No place in the world, not matter how isolated, is entirely safe from POPs contamination.

This does not mean that the region does not need to take action. Increasing imports for a growing population translates into potentially increased exposure to everyone. Increases in the number and size of vehicles, and of all engines on the island contributes to higher exposure. All fires contribute, as well. If you use driftwood in your fire, the salt in the wood increases the POPs that are released. In some islands, where firewood is scarce, people use plastic bags to start the fire, also increasing the POPs. In general, when the fire burns at a low temperature and has a lot of smoke, more POPs are released.

Because POPs are persistent and the time when a person becomes ill may be several years after exposure, it is difficult to connect the disease with the POPs exposure. A disease or condition can rarely be traced back to an exposure during childhood, and probably the child was totally unaware of the exposure. As people get older, many of the diseases are typically chronic conditions. More bad news is that POPs are often passed onto the next generation from a mother to her baby during pregnancy and by breastfeeding. This is a time when human being are particularly vulnerable, but the real cause of a health problem later in life may never be truly identified.

As is the case with any pollutant, fragile island environments can be also damaged by POPs. Heavy rainfall washes everything to the sea, a typhoon could cause serious ecological damage. Eliminating, to the fullest extent possible, POPs chemicals from Pacific Island Countries is the solution that will provide as close to a 100% level of protection as possible.

POPs are a threat to the good health of families in the FSM. Not all POPs chemical are found in the country, but the threat should be considered serious because some of the POPs are here now, and their levels are increasing. With carefully planned strategies, the residents of the islands of the FSM will be able to eliminate most of the POPs from their islands. The remainder can be substantially reduced to minimize exposure.

POPs Awareness Message #6 - Introducing The Persistent Organic Pollutants Dirty Dozen

These are the twelve chemicals that are included in the Persistent Organic Pollutants (POPs) list. The Stockholm Convention has mechanisms in place to add additional hazardous chemicals to the list, but these twelve were identified as the most dangerous at this time. The review of the efforts necessary and the lessons learned while trying to eliminate and control the first twelve POPs, will be useful information in planning the activities to deal with the new POPs chemicals added to the list in the future.

Most of the following information comes from the Agency for Toxic Substances and Disease Registry of the Centers for Disease Control and Prevention, and the Inter-Organization for the Sound Management of Chemicals

1) Aldrin – A pesticide applied to soils to kill termites, grasshoppers, corn rootworm, and other insect pests. Aldrin is a white or tan to dark brown crystalline (sand-like) material. It also comes in a liquid form. It has a mild chemical odor. Aldrin can affect people when breathed in and by passing through the skin. It may decrease fertility in males and females. Low level exposure can cause skin and eye irritation, and may damage the liver. High exposure can cause headache, dizziness, nausea and vomiting, muscle spasms, severe seizures, and death. Aldrin builds up in the body and after years of exposure can begin to affect the nervous system. In the U.S. aldrin was completely banned in 1987. Other names for aldrin include: Seedrin, Octalene, and HHDN

2) Chlordane – Used extensively to control termites and as a broad-spectrum insecticide on a range of agricultural crops. It is a combination of many chemicals, and is a thick liquid whose colors ranges from colorless (clear) to amber which may be odorless or have a mild irritating smell. When used as a spray, Chlordane is mixed with emulsifiers which gives it a milky-looking mixture. Chlordane exposure comes from skin contact, breathing contaminated air, or by digesting contaminated food. High exposure to Chlordane damages the nervous system, the digestive system and the liver. Large amounts swallowed will cause convulsions and death. Exposure to small amounts by ingestion or breathing can cause headaches, irritation, confusion, weakness, vision problems, stomach upset or cramps, vomiting, diarrhea, and jaundice. Chlordane's use in the U.S. was stopped in 1988, but manufacture for export continues. Other names include Octachlor and Velsicol 1068.

3) DDT – Perhaps the best known of the POPs, DDT (dichlorodiphenyltrichloroethane) was widely used during World War II to protect soldiers and civilians from malaria, typhus, and other diseases spread by insects. It was banned in the US in 1972, but continues to be applied against mosquitoes in several other countries to control malaria. It is a white, crystalline solid with no odor or taste. Exposure is mostly from eating foods (root and leafy vegetables, meat, fish, and poultry) which are contaminated. Near waste sites, both air and drinking water may be contaminated and lead to exposure. DDT affects the nervous system and causes excitability, tremors, and seizures. In women exposure may cause a reduction in the duration of lactation (breast milk production) and increased risk of premature child-birth. DDT

probably causes cancer, but this is not yet confirmed. Two other hazardous substances, called DDE and DDD have similar characteristics as DDT.

4) Dieldrin – Used principally to control termites and textile pests, dieldrin has also been used to control insect-borne diseases and insects living in agricultural soils. Pure dieldrin is a white powder with a mild chemical odor. Mixtures prepared for retail sale may have a tan color. The characteristics of dieldrin are the basically the same as aldrin (see above). Some brand names for dieldrin include Alvit, Dieldrite, Dieldrix, and Quintox.

5) Endrin – This insecticide is sprayed on the leaves of crops such as cotton and grains. It is also used to control mice, moles and other rodents. Endrin is a solid, white, almost odorless substance which has not been sold in the U.S. since 1986. Exposure to high doses may result in headaches, dizziness, nervousness, confusion, nausea, vomiting, and convulsions. Swallowing very large amounts of endrin may cause convulsions and death in a few minutes or hours. Exposure to endrin usually occurs from the air, water, or soil which has become contaminated due to a nearby hazardous waste site. Since endrin can remain in soil for as long as 10 years or more, it can be found in plants grown in contaminated soil. It is found in the tissues of organisms that live in water, and also in human breast milk. Other names for endrin include: Compound 269, Endrex, Hexadrin, Isodrin, and Nendrin.

6) Heptachlor – Primarily employed to kill soil insects and termites, heptachlor has also been used more widely to kill cotton insects, grasshoppers, other crop pests, and malaria-carrying mosquitoes. Heptachlor, in its pure form, is a white powder that smells like camphor. Commercial, less pure grades, may be tan. Use of the substance stopped in 1988. Heptachlor can damage the nervous system, and people who have swallowed it or had skin contact became dizzy, confused or had convulsions. Exposure is usually from eating contaminated foods and milk, or skin contact with contaminated soil. Heptachlor can remain in soil for many years and builds up in the fatty tissues of fish and cattle, and also shows up in dairy products. Exposure usually occurs from the air, water, or soil which has become contaminated due to a nearby hazardous waste site. Heptachlor is found in human breast milk of mother who have had high exposures. Trade names include: Heptagran, Basaklor, Drindrox, Soleptax, Termide, and Velsicol 104.

7) Mirex – This insecticide is applied mainly to combat fire ants and other types of ants and termites. It has also been used as a fire retardant in plastics, rubber, and electrical goods. The substance has not been manufactured or used in the U.S. since 1978. Mirex is a white crystalline solid which is odorless. Exposure occurs mainly from skin contact or eating soil or food that is contaminated. High levels of exposure is linked to damage to skin, the liver, nervous system, and reproductive system. Mirex can remain for years in soil and water, and will build up in the tissues of fish or other organisms that live in contaminated water or eat other contaminated animals. Studies on mice and rats indicate that mirex can cause cancer in animals. Other names are Dechlorane, Ferriamicide and GC 1283.

8) Toxaphene – This insecticide, also called camphechlor, is applied to cotton, cereal grains, fruits, nuts, and vegetables. It has also been used to control ticks and mites in

live-stock. It usually exists as a solid or gas, and in its original form is a yellow to amber waxy solid that smells like turpentine. It was heavily used in the US until 1982 and completely banned in 1990. Breathing, eating, or drinking high levels of toxaphene can damage the lungs, nervous system, kidneys and can cause death. There is no information on the health effects of low level exposures. Studies indicate that toxaphene can be reasonable anticipated to cause cancer. It breaks down very slowly in the environment, so it accumulates in fish and animals. Exposure typically occurs through contaminated air near hazardous waste sites, eating contaminated fish or shell fish, or drinking water from contaminated wells. There are many trade names for toxaphene, some are: Alltex, Attac 4-2, (also 4-4, 6, 6-3) Camphechlor, Compound 3956, Huilex, Motox, Strobane T-90, Texadust, and Vertac 90%.

9) Hexachlorobenzene (HCB) – HCB kills fungi that affect food crops, and was used in the U.S. until 1965. It is also released as a byproduct during the manufacture of certain chemicals and as a result of the same processes that give rise to dioxins and furans. HCB has been used to make fireworks, ammunition, and synthetic rubber. HCB is a white crystalline solid, which is not very soluble in water. It deteriorates very slowly and thus remains in the environment for a very time. HCB particles will settle to the bottom of lakes and rivers, where it can build up in fish, lichens, marine mammals, and then other animals (birds, caribou) that eat these things. Plants growing in contaminated soil will accumulate HCB's. People are exposed by eating contaminated foods and dairy products, drinking contaminated water or milk, breathing contaminated air, or handling contaminated soil. HCB is found in human breast milk, and workers in factories which unintentionally produce HCB's can be exposed. Unborn children can be exposed if the expectant mother is exposed. The health effects include liver disease and related complications, and studies show that it is likely a carcinogen. Trade names for HCB include: Amaticin, Anticarie, bunt-cure, Co-op hexa, Granox, Sanocide, Smut-go, and Sniecotox.

10) Polychlorinated Biphenyls (PCBs) – These compounds are employed in industry as heat exchange fluids, in electric transformers and capacitors, and as additives in paint, carbonless copy paper, sealants and plastics. PCBs are mixtures of chlorinated compounds. PCBs are either oily liquids or solids that are colorless to light yellow, and have no known taste. Some PCBs can exist as a vapor in the air. They are man-made; there are no known natural sources of PCBs. The manufacture of these substances were stopped in the U.S. in 1977, because of the evidence that they build up in the environment and cause health problems. PCBs are very long lasting and can be transported by air currents for long distances. Thus, they are everywhere in the environment, being released from hazardous waste sites, leaks from devices containing PCBs, and from the burning of contaminated items. PCBs bind strongly to soils. Most human exposure to PCBs comes from the consumption of contaminated fish and other animals which eat these fish. The most common health effect are skin diseases similar to acne or rash, and possibly liver damage. Many health organizations believe that PCBs are carcinogenic to humans. Women who are exposed to relatively high levels of PCBs may have lower birth-weight babies, and these babies may show abnormal responses in tests of infant behavior. There are many different mixtures of PCB compounds. Askarel, Aroclor, Pyranol, Pyroclor, Phenoclor, Pyralene are some of the trade names.

11) Dioxins – These chemicals are produced unintentionally due to incomplete combustion, as well as during the manufacture of certain pesticides and other chemicals. In addition, certain kinds of metal recycling and pulp and paper bleaching can release dioxins. Dioxins have also been found in automobile exhaust, tobacco smoke, and wood and coal smoke. (See furans for information about these two very similar POPs.)

12) Furans – These compounds are produced unintentionally from the same processes that release dioxins, and they are also found in commercial mixtures of PCBs. Dioxins and furans are produced from natural sources such as forest fires, as well as the man-made sources noted above. The substances can be carried long distances by air and water. As a result, dioxins and furans have existed for centuries, and are now found almost every where at low levels. These substances build up in the food chain, resulting in higher concentration in animals near the top and humans. In the general population, 90% of exposure to dioxins and furans is by eating foods such as meat, dairy products, and fish. Other exposures come from contaminated air and water. People living near uncontrolled hazardous waste sites, or downwind from incinerators or power generation plants may be at increased risk. The health problems which result from high exposures include severe skin disease (chloracne), rashes, skin discoloration, and possibly liver damage. Long term effects include possible altered glucose metabolism (similar to diabetes), and changes in hormone levels. Animal studies have shown an increased risk of cancer from exposure to dioxins and furans.

POPs Awareness Message #7 - Evidence of Persistent Organic Pollutants

When a person accidentally cuts his or her finger with the knife, there is an obvious and unambiguous connection between the causing event (the erroneous stroke of the knife) and the resultant health problem (the cut finger). It is clear and straightforward, cause and effect.

When doctors and scientists examine the causes and effects related to Persistent Organic Pollutants (POPs) and other hazardous substances, there is sometime a clearly understandable connection and sometime there is not. The type and severity of the harmful effects of exposure will be influenced by many factors: the dose (how much), the duration (how long), the exposure pathway (breathing, eating, drinking, or skin contact), the effects of other chemicals or substances to which you may also have been exposed, and your individual characteristics such as age, gender, nutritional status, and the general state of your health. For a "low" direct exposure to many of the POPs substances, the resulting conditions may include one or more of the following symptoms: a skin rash or irritation, severe acne, eye irritation or burning, dizziness, headache, vomiting, convulsions.

Accidental spills of POPs containing pesticides have killed and seriously sickened workers on farms and gardens. The connection between the spill and the resultant injuries and deaths can be easily documented. In the days following the worst industrial disaster in history (on the night of 3 December 1984, in Bhopal, India, a cloud of deadly gas leaked from a tank at a pesticide manufacturing facility and killed over 2,000 people

and injured as many as 200,000 others), the investigators of the tragedy were easily able to determine the course of events. However, the harm caused to the environment, to animals, and to human beings, by low levels of POPs chemicals can be very difficult to prove in many cases.

All of the serious illnesses that result from low level POPs exposure, such as cancer, immune system disorders, central nervous system damage, liver malfunction, memory loss, birth defects, other reproductive difficulties, learning disabilities, are conditions that for the most part have a very gradual build up of symptoms and then at a certain point it becomes evident that something is "wrong". Since the time between exposure and the awareness that a health problem exists may be several years, the connection my never be made, and the culprit substance never identified.

Many of these connections are impossible to link. It is difficult to prove that a person's immune system may be weaker than it might have been, or that a child is a slower learner than it might have been. So the evidence must be gathered from wherever and whenever it can be discovered. Scientists are gathering more evidence all the time. In the St. Lawrence River (in eastern North America between the US and Canada) beluga whales have been observed to suffer several kinds of cancers, twisted spines and other skeletal disorders, and various afflictions that are seldom, if ever, seen in beluga whales living in other areas with less polluted waters. Alligators living in the US state of Florida have stunted reproductive organs and cases of infertility not found in alligators elsewhere.

There is growing evidence that POPs cause cancer, and in Sweden, Canada and other countries studies have strongly suggested that food with very low levels of contamination are causing immune system abnormalities. Mexican and US studies have shown that children exposed to pesticides, including those containing POPs, have significantly more problems with learning and physical coordination than children living in cleaner locations.

It is not yet possible to measure the overall, world-wide burden of POPs, and it may never happen. Control efforts from the global level down to the neighborhood level, should follow the guidelines of the Stockholm Convention to eliminate and/or reduce the use of POPs substances as quickly as possible. As the first twelve POPs chemicals are successfully addressed the Convention has mechanisms in place to initiate efforts to identify the next set of POPs.

<u>POPs Awareness Message #8</u> - What is the Solution to the Persistent Organic Pollutants Problem?

The problem is a big one and everyone has a chance to help. Even small efforts at the individual level are valuable and added together can result in major contributions. In the FSM, we are lucky that some of the Persistent Organic Pollutants (POPs) chemicals have never been brought here intentionally, but we are also unlucky in that a relatively small hazardous substance "spill" can cause substantial damage to our fragile island environments. The bottom line is that we must all do our part.

At the global level, all nations need to ratify and follow the Stockholm Convention's regulations and guidelines. It is our best opportunity to reduce the harm to the

environment, the earth's wildlife, and to the human inhabitants of the planet. POPs contamination and exposure do not stop at the border, they do not stay put in one place. Consensus is essential for a international agreement affecting the entire world. The Convention is a case of everyone benefiting if everyone participates, and of everyone losing if only a few do not join in and cooperate.

At the regional level, nations and international organizations must follow the prescribed actions and recommendations of the Stockholm Convention. Production of all POPs must be stopped as soon as possible, and research in the development of safe alternatives must be supported. Countries must stop the import of POPs, and the use of POPs as soon as possible. Governments must adopt regulations that control the activities, such as incineration and the manufacturing of products that produce POPs as an unintentional byproduct. Citizens should lobby their governments to ratify and adhere to the provisions of the Stockholm Convention.

At the state and national levels, environmentally "friendly" legislation needs to be established. The importation and use of POPs containing substances must be strictly controlled until total elimination is achieved. Governments should encourage and provide legislative support to waste reduction strategies, proper waste management procedures, hazardous substance registration, and regulations that ensure that the general public is well informed and aware of the safe storage, use, and disposal of all potentially dangerous substances.

In the island neighbourhoods, community level programs that reduce the waste stream must be developed, such as recycling of plastics, metals, glass, and paper. Stores should encourage customers to reuse shopping bags, not to use plastic bags, and decrease the ordering of products with unnecessary, excess packaging. Laws restricting the use of POPs chemicals need to be strictly enforced, and the provision of safe alternative products encouraged. Information must be made available to residents about how to recognize potential POPs hazards, and assistance provided on how to properly dispose of materials containing, or contaminated with, POPs chemicals.

At home, members of the family should reduce, reuse, and recycle as much as possible. Purchase products that are made with recycled materials, and that are not disposable. Don't trade convenience for an environment polluted with POPs. For example, matches are less harmful to the environment than lighters. Vehicles that are serviced regularly and tuned up properly produce less POPs emissions. Do not burn rubbish, garbage or other trash at your residence. Make sure that cooking fires are supplied with plenty of oxygen and use clean fuel at all times. Do not use plastics or other POPs containing substances to start your fire. If possible, locate cooking locations downwind of the places where people live and sleep. And last, but very important; keep alert to any potential sources of POPs in your village or town. Report them to the Police, the Environmental Protection Agency, or the Health Department.