



**Government of Samoa
Ministry of Natural Resources and Environment**

**Samoa's
National Implementation Plan
for
Persistent Organic Pollutants**

December 2004

TABLE OF CONTENTS

	Page Number
LIST OF ACRONYMS	3
FOREWORD	4
EXECUTIVE SUMMARY	5
1. INTRODUCTION	7
2. METHODOLOGY	7
3. COUNTRY BASELINE	9
3.1 Country Profile	
3.1.1 Physical and Demographic context	
3.1.2 Political and Geographic structure of the Country	
3.1.3 Economy	
3.1.4 Environment	
3.2 Institutional Policy and Regulatory Framework	11
3.2.1 Environmental Policy, Sustainable Development Policy and General legislative framework	
3.2.2 Roles and Responsibilities	
3.2.3 Relevant International Commitments and Obligations	
3.2.4 Existing Legislation and Regulations Addressing POPs	
3.2.5 Education and Public Awareness Needs and Gaps	
3.3 POPs Assessment:	15
3.3.1 Introduction	
3.3.2 Background	
3.3.3 Production, Import and Use	
3.3.4 Levels and Trends	
3.3.5 Stockpiles	
3.3.6 Contaminated Sites	
4. STRATEGIES AND ACTION PLANS OF THE NIP	23
4.1 Policy Statement	
4.2 Implementation Strategy	
4.3 Strategies and Action Plans	
4.4 National Implementation Framework	
4.5 Indicative Financial Plan	
5. PRIORITY PROJECTS	53
BIBLIOGRAPHY	54
LIST OF PEOPLE CONSULTED	58

LIST OF ACRONYMS

APCS	Air Pollution Control Systems
ASC	Agriculture Store Corporation
AusAID	Australian Agency for International Development
CMU	Chemicals Management Unit
COC	Chamber of Commerce
DDT	Dichloro-diphenyl-trichlorethane
DEC	Division of Environment and Conservation
EIA	Environment Impact Assessment
EPC	Electric Power Corporation
GDP	Gross Domestic Product
GEF	Global Environment Facility
GOS	Government of Samoa
HCB	Hexa-Chloro-Benzene
ICA	Institutional Capacity Assessment
ICT	Information and Communication Technology
IPC	Island Pest Control
LSEAct	Lands, Survey and Environment Act 1989
MAF	Ministry of Agriculture & Fisheries
MCIL	Ministry of Commerce, Industry and Labor
MESC	Ministry of Education, Sports & Culture
MFAT	Ministry Foreign Affairs and Trade
MNRE	Ministry of Natural Resources & Environment
MOF	Ministry of Finance
MFR	Ministry for Revenue
MOH	Ministry of Health
MPPFS	Ministry of Police, Prisons and Fire Services
MWCSD	Ministry of Women, Community and Social Development
MWH	Montgomery Watson and Harza Ltd.
MWTI	Ministry of Works, Transport and Infrastructure
NGOs	Non-Government Organisations
NIP	National Implementation Plan
NTT	National Task Team
NUS	National University of Samoa
OAG	Office of the Attorney General
PCBs	Polychlorinated Biphenyls
PCP	Penta-Chloro-Phenol
PECL	Pacific Environment Consultants Ltd.
POPs	Persistent Organic Pollutant(s)
PTS	Persistent Toxic Substances
PUMAct	Planning and Urban Management Act 2004
PUMA	Planning and Urban Management Agency
SAME	Samoa Association of Manufacturers and Exporters
SFC	Samoa Forest Corporation
SPA	Samoa Ports Authority
SPREP	Secretariat of the Pacific Regional Environment Programme
SWA	Samoa Water Authority
TEQ	Toxic Equivalent
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USP	University of the South Pacific
WHO	World Health Organisation

FOREWORD

The Government of Samoa (GOS) wishes to thank the Parties of the Stockholm Convention for Persistent Organic Pollutants (Stockholm Convention) and its Secretariat under the United Nations Environment Programme (UNEP) for recognising the global threat of persistent organic pollutants (POPs) to the environment as well as human health. Samoa also acknowledges the support by the Global Environment Facility (GEF) to fund the enabling activity for POPs that facilitated the development of its National Implementation Plan (NIP).

Samoa's NIP targets the reduction, elimination and monitoring of POPs and persistent toxic substances (PTS). Key to the success of the NIP is the effective coordination of a national effort to ensure our islands and people are safe from the harmful effects of such chemicals. It is only when the knowledge on such things dangerous is shared and disseminated that we may be able to effectively counter their adverse impacts.

Although POPs pesticides have been phased out in Samoa and contaminated transformers are being eliminated there is a very real concern that our people are unaware of the constant release of dioxins and furans into our atmosphere and how these releases affects the health and environment of our people. The use of pesticides in the past also left behind a legacy of contaminated sites that need rehabilitation. It is hoped that through this NIP Samoa will minimise and remove from our islands the dangers of POPs and PTS.

I would like to acknowledge several institutions and stakeholders who partook in formulating Samoa's NIP. These include: the United Nations Development Programme (UNDP) office based in Samoa and the Ministry of Finance (MOF) for their timely facilitation of the project, members of the POPs National Task Team (NTT) as well as their respective agencies and organisations for guiding all activities of the project and the Pacific Environment Consultants Ltd. (PECL) and Montgomery Watson & Harza Ltd. (MWH) of New Zealand for their involvement in developing the NIP. A special thank-you also to all those who participated in several national workshops on POPs and the NIP, whose comments and feedback further progressed the development of the NIP. These include: the Government ministries and corporations, non-governmental organisations (NGOs) and the different community groups and representatives

Faafetai



Faumuina Tiatia Liuga
Minister of Natural Resources and Environment

EXECUTIVE SUMMARY

Samoa's NIP for POPs incorporates the findings of several studies implemented to assess the presence of POPs chemicals and levels of contamination, areas of significant contamination, the country's institutional capacity to formulate and implement a plan for POPs reduction and elimination, and to finalise an inventory of POPs in the country.

Samoa's POP's inventory reveals the presence in the country of 8 of the 12 POPs targeted by the Stockholm Convention and a ninth suspected from the presence in pesticides in which it is a known impurity. These are aldrin, chlordane, dieldrin, Dichloro-Diphenyl-Trichloroethane (DDT) and heptachlor as pesticides, Poly-Chlorinated Biphenyls (PCBs) as an industrial chemical and dioxins and furans as unintentional introductions. Hexachlorobenzene (HCB) is present as an impurity in chlorothalonil, pentachlorophenol (PCP), atrazine, picloram and others.

Calculations of unintended releases of dioxins and furans using the Convention Toolkit methodology show an annual release of about 1.4 gramme of Toxic Equivalents per annum (TEQ/a). This total is low relative to other more populated countries, e.g. New Zealand, but higher on a per capita basis. However, because of this continuing albeit unintentional release, it also makes dioxins and furans the most prevalent of POPs chemicals in Samoa's environment.

Five sites have high levels of POPs contamination and are identified as priority sites requiring remediation. These are the Agricultural Store Corporation's (ASC) Vaitele compound, Island Pest Control (IPC) facility in Vaivase, the Samoa Forest Corporation (SFC), Asau decommissioned timber treatment facility, the Electric Power Corporation's (EPC) compound at Vaitele and William Arp estate at Moamoa-tai and Alafua. Others include marine sediments at the Apia wharf, mangrove margin of the oil tank storage at Sogi and EPC generation site at Tanugamanono.

Because all identified POPs have since been non-consented for further importation and because there is no local manufacturing of intentional production of POPs chemicals, the strategies and action plans of Samoa's NIP focuses on safeguarding against illegal importation, the cleaning up of contaminated sites, the disposal of existing stockpiles, reduction of unintentional releases, continuing monitoring of other suspected sites and media, public awareness and education and the building of local capacity to effectively implement actions in these key areas.

Safeguarding against illegal importation calls for the strengthening of legal frameworks which, to date, adequately regulates against the importation of POPs pesticides but not other potentially hazardous chemicals imported for general industrial use. A review of all chemicals-related legislation is recommended to determine how best to address several issues including possible overlapping of legislation, ambiguous definitions, and the loophole with respect to chemicals imported for general industrial use and others.

Actions for cleaning up contaminated sites prescribe the prior selection and preparation of proper disposal sites, the shipment of existing stockpiles of POPs and other intractable pesticides under a project for Pacific Island countries including Samoa funded by the Australian Agency for International Development (AusAID) and assisted by the Secretariat of Pacific Regional Environment Programme (SPREP). Actions for the continuing monitoring and assessment of several other suspected sites is indicative of the on-going work needed to fully rid the country of all areas that have high and dangerous levels of contamination. Unintentional releases of dioxins and furans require actions to regulate and minimise emissions from motor vehicles, power plants, and open burning.

Having the relevant technology and technical capacity are crucial elements of the NIP, especially since these have been identified as lacking in Samoa. All actions under the major objectives of the Convention entail an element of public awareness and involvement. This is a significant feature of the NIP. The health and environmental impacts of POPs need to be well understood at all levels of the community, many of whom handled POPs pesticides directly when these chemicals were considered safe and necessary for banana plantations and other purposes. Some of the contaminated areas are within villages' jurisdictions and often accessed freely by community members without knowledge of the health risks involved.

The NIP is summarised and presented in a matrix format that shows proposed actions, success indicators, implementing agencies/organisations and the corresponding objectives of the Stockholm Convention that each action contributes to. An indicative budget over the first five years of NIP implementation is provided, identifying estimated costs, potential sources of funds and reflecting priorities for actions in the schedule of activities.

1. INTRODUCTION

Samoa ratified the Stockholm Convention on POPs on 4 February 2002. The Convention entered into force on the 17 May 2004.

As a party to the Convention, one of Samoa's first obligations is the compilation of an initial inventory and the formulation of a National Implementation Plan (NIP) for the proper management and eventual elimination of POPs. With GEF funding the Planning and Urban Management Agency (PUMA) of the Ministry of Natural Resources and the Environment (MNRE) initiated the POPs project in January 2002 with several activities including the compilation of an initial inventory of POPs and PTS. The consulting firm of MWH) undertook this work under contract. The PECL was also contracted in July 2003 to finalise the POPs and PTS inventory, assess the extent of POPs contamination and the country's institutional capacity and to compile the NIP.

The NIP is based largely on the findings of three studies; namely, the POPs and PTS Assessment Report, the POPs Inventory Report, and the Institutional Capacity Assessment (ICA) Report. Relevant comments and inputs received from public consultations, reviewers amongst members of the NTT and other experts have been incorporated into the three source reports, as well as the NIP. All of the justifications and backgrounds to actions proposed in the NIP are provided in these reports. The NIP will therefore be more easily explained and understood when read in conjunction with the aforementioned documents.

The NIP was formulated using a broadly consultative process ably led and coordinated by the PUMA of the MNRE, with the support of the NTT for POPs, and involving a large number of government agencies, corporations, NGOs and private sector representatives. The initial NIP draft went through several drafts to incorporate comments and inputs from members of the NTT and others. Presentations of the draft NIP were also made at two public meetings held in conjunction with the national chemical awareness day activities organised by PUMA. The same public meetings also presented a valuable opportunity to promote and raise public awareness both of POPs and of the NIP (Figures 1-4).

The NTT's finalisation of the draft NIP report included further consultation workshops with representatives of: government agencies and corporations; NGOs; village mayors, women groups, youth leaders, farmers' association; the Samoa Association of Manufacturers and Exporters (SAME) and the Chamber of Commerce. (COC). When finalised the NIP was submitted to Cabinet for endorsement with a view for consequent transmission to the Secretariat of the Stockholm Convention.

2. METHODOLOGY

Samoa's NIP for POPs was initiated and developed in partnership with the Government of Samoa and the GEF. With funds made available from GEF through the UNDP Samoa's enabling activity for POPs began; with the MNRE as the national execution agency.

To implement the provisions of the Stockholm Convention the PUMA was selected as the national lead agency. Following this, a special POPs unit and NTT were also established. The unit consisted of persons employed specifically for their chemicals and environmental background and expertise, and were tasked with the responsibility of creating and strengthening an enabling environment for the management of POPs. This included; awareness raising, capacity building, and the development of a NIP for POPs. The NTT was selected from a wide range of institutions and organisations that have different views and interests in Samoan society.



Figure 1: Participants at NIP criteria workshop



Figure 2: NTT meeting



Figure 3. Third national chemicals awareness day Savaii Island



Figure 4: Consultation workshop with government agencies

The PUMA as the national lead agency together with the NTT contracted the firm of PECL to develop and produce the draft NIP. Preparations for the compilation of the draft NIP included:

1. An agreement with PECL on the terms of reference for the development of the NIP;
2. Endorsement of PECL's proposed work plan for developing the NIP;
3. PECL undertaking an independent expert review of the Initial Inventory of POPs and PTS in Samoa that was compiled by MWH;
4. Endorsement by the NTT of the recommendations from the independent review report and the proposed work plan for completing the POPs inventory and the institutional capacity assessment;
5. Assessment of existing available information and the conducting of field sampling and interviews on gaps identified in the Initial Inventory;
6. PECL consulting members of the NTT on an individual basis;
7. PECL consulting experts outside of the NTT;
8. National workshops for the estimation of dioxin and furans;

9. National workshop on the draft NIP;
10. Presentations on the draft NIP during the national chemical awareness day, both for Upolu and Savaii;
11. Review of the assessment reports and draft NIP by the NTT;
12. Review of the assessment reports and draft NIP by experts outside of the NTT;
13. Completion and submission of Assessment reports and draft NIP to PUMA and the NTT;
14. Acceptance of the draft NIP by the NTT;
15. Further six national consultation workshops and a separate NTT meeting to reach consensus on the draft NIP;
16. Finalisation and acceptance of the final NIP by the NTT and MNRE;
17. Submission of the final report to Cabinet for their endorsement and approval; and
18. Transmission of the final NIP to the Stockholm Convention Secretariat.

Throughout the consultancy the Project Coordinator of the POPs unit monitored PECL's activities on matters relating to the implementation of their consultancy. This progress was then presented to the NTT during its monthly meetings where the NTT was given opportunity to present feedback, further instructions and information on several issues and matters needed to complete the draft. The draft NIP was completed and considered by the NTT in April 2004.

In finalising the draft NIP report a further seven consultation workshops were held from August through October 2004 to reach consensus on the submitted draft report. Four consultation workshops and a separate NTT meeting were held on the main island of Upolu while two others were held on the larger but less populated island of Savaii. The POPs unit, together with sub-committee members of the NTT, facilitated focus group discussions with the participants to ascertain comments for incorporation into the final NIP report. Following this, the NIP was finalised and accepted by the NTT and the MNRE in December 2004.

3. COUNTRY BASELINE

3.1. Country Profile

3.1.1 Physical and Demographic Context

Samoa consists of two main islands namely Upolu and Savaii and seven smaller islands (Figure 5) all of which lie between about 13° and 14° South latitude and 171° and 173° West longitude. The total land area is 2,934 km² and a sea area within Samoa's Exclusive Economic Zone is about 128,000 km². The most populous and developed island is Upolu, where the national capital Apia is located. About 80 per cent of the land is under customary tenure.

The 2001 Census enumerated slightly more than 167,000 persons, about 98 per cent of whom are Samoans including assimilated Europeans (referred to separately as part-European to the 1950s), Chinese and other Pacific islanders. The same census recorded 40,000 people living in and around the urban area of Apia. There has also been considerable migration from Savaii to the North West of Upolu. The resulting higher population concentration in the NW Upolu and Apia Urban Area is a cause for concern regarding the carrying capacity of the environment and natural resources to support it. There is inevitable pressure and impacts on water resources, land use planning and management, atmosphere and climate change, waste management, agriculture and forestry, fisheries and marine resources.

The 1991 Census recorded the workforce employed in industries other than agriculture, forestry and fishing in the greater Apia area at 51% to 60%, 21% to 30% per cent in most of the rest of northern Upolu, and on Savaii in districts encompassing Salelologa and Asau.

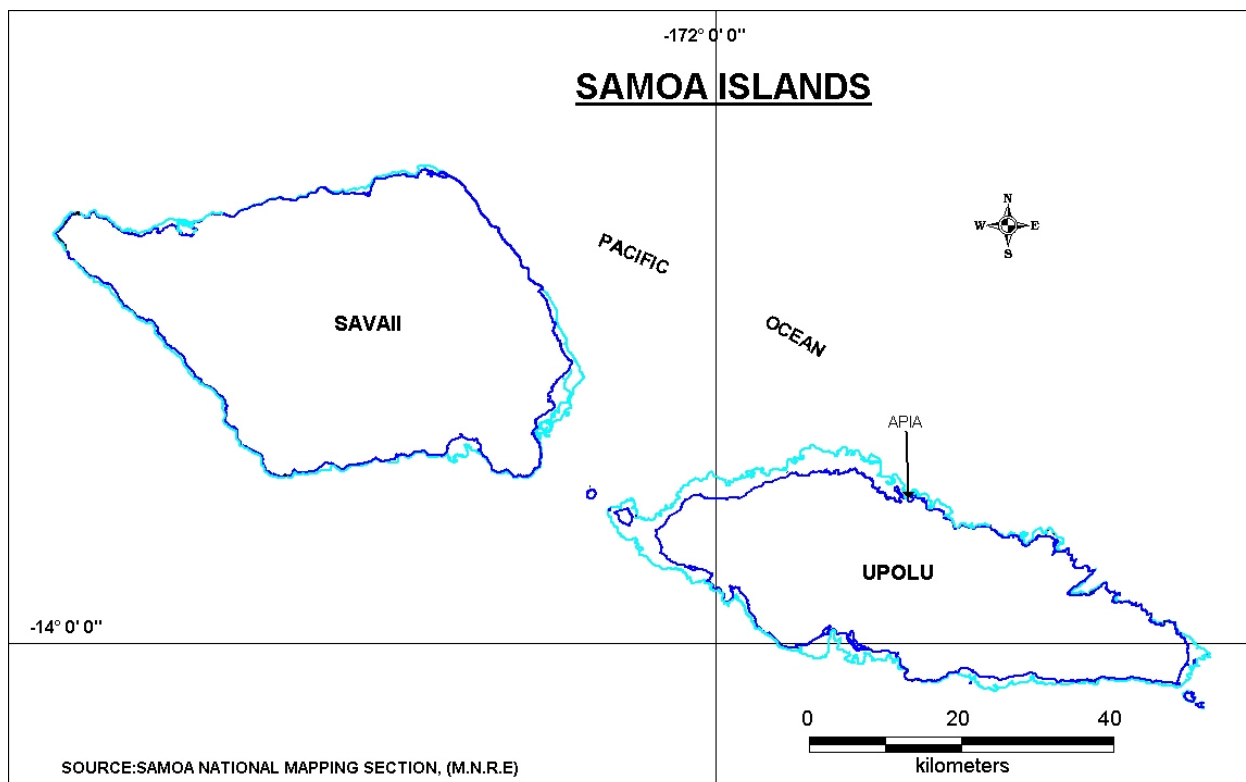


Figure 5. Map of Samoa Islands

3.1.2 Political and Geographic Structure of the Country

Samoa has a representative democratic parliamentary system of government. The Constitution provides for a Head of State, a Prime Minister, a Cabinet of Ministers who comprises the Executive Council, and a 49-member Legislative Assembly. Members of the Legislative Assembly are elected by universal suffrage from 41 electoral constituencies and for a term of five years. The last election took place in March 2001. The Village Fono Act 1990 recognizes village by-laws which gives traditional village councils authority over the management of village affairs in collaboration with the national government.

Approximately 50% of Savaii and 40% of Upolu are of steep slopes derived from volcanic activity. Both islands have central mountain ridges formed from a chain of volcanic peaks and craters. In Upolu, the mountain range runs along the length of the island with some peaks rising to more than 1000 metres above sea level, surrounded by flat and rolling coastal plains. Savaii contains a central core of volcanic peaks reaching 1858m at the highest point and encompassed by a series of lava-based plateaus, hills and coastal plains. All the islands of Samoa were formed by volcanic activity. Most soils were derived from basaltic volcanic flows differing largely in age and type of deposit. The young volcanic structure of the island means the soils is at places very porous for leaching into the groundwater system.

3.1.3 Economy

The economy is relatively small with aggregate Gross Domestic Product (GDP) in current prices of \$720 million (approx. US\$200 million) in 1999 implying a per capita income of US\$1,390. Economic performance is constrained by distance to markets, a small local market, and a limited labor base that cannot compete with Asian countries in labour-intensive production and a high vulnerability to natural disasters particularly cyclones.

The agricultural sector accounts for 10-15% of GDP and is characterized by a substantial subsistence base which continues to provide a source of livelihood for over 80% of the population and a high level of domestic food security. More recently, the fisheries sector has replaced agriculture as the dominant export earner.

The second half of the 1990s was characterized by relative prosperity based on strong performances in the tourism and fisheries industries. GDP growth in 1998 was 3.4% rising to 5.6% in 1999 and 4.0% in 2000 driven mainly by the fishing sector, construction, commerce, transport and communication. At the same time inflation declined to 0.3% in 1999 the lowest level in five years. Inflation is expected to remain low as tariff cuts resulting in competitive trading conditions work through to consumer prices.

The relatively successful introduction of extensive economic and financial reforms in the second half of the 1990s has made the last decade a historical turning point in the development of Samoa. These reforms have included, building effective partnerships between the government and the private sector, overhauling of the revenue structure for the government based on the introduction of the value added goods and services tax, a reduction and simplification of import tariffs and income taxes, institutional strengthening of government departments and corporations, corporatisation and privatisation of selected public sector activities, financial sector liberalisation and overall pursuance of good governance principles in the public sector.

3.1.4 Environment

Samoa's biological environment reflects a rich natural heritage of high species diversity and endemism. It is estimated that Samoa supports 775 native vascular plant species of which approximately 30% of the angiosperms are endemic. There are about 280 genera of native angiosperms (more than any other archipelago in Polynesia). In addition, there are about 250 introduced plant species and 47 threatened plants.

Samoa's fauna consists of 21 butterfly species, 11 species of reptiles, 43 resident bird species eight of which are endemic, two flying fox species, and a bat (Taule'alo, 1993). This biodiversity constitutes an essential aspect of the Samoan culture, with many cultural proverbs and oratory traditions derived from or reflecting relationships with the forests, reefs, marine life and land animals.

The smallness and geographical isolation of Samoa's islands from continental landmasses resulted in the high level of species endemism. At the same time, the same factors provide the seeds for its ecological fragility and vulnerability. For instance, many species have limited defenses against aggressive invasive species, and while endemism is high at the species level, it is less diversified at higher taxonomic levels. Genetic variability is thus limited.

The ecological vulnerability inherent in its smallness, isolation, and limited genetic variability is exacerbated by the ever present threat of extreme events such as cyclones, flooding, climate variability, and the impacts of human activities. In this context, the environmental and human threat that POPs chemicals present aggravates an already challenging situation.

3.2 Institutional, Policy and Regulatory Framework

3.2.1 Environmental policy, sustainable development policy and general legislative framework

Samoa's Development Strategy for 2002-2004 promotes a vision of '...improved quality of life for every Samoan premised on sustained economic growth, improved education, enhanced health standards and strengthened cultural and traditional values.'

Enhancing health standards and sustaining economic growth are dependent, amongst other factors, on a healthy biophysical environment and natural resource base. This rationale underpins environmental protection and sustainable development strategy.

The elimination of POPs which Samoa committed itself to when it ratified the Stockholm Convention on POPs, constitutes one of several elements of Samoa's overall strategy for the protection of its environment and the pursuit of sustainable development.

Samoa's legislative framework for regulating the importation and management of POPs and other PTS hinges mainly on the Pesticides Regulation 1990 and to a lesser degree, the Poisons Act 1968. This framework covers most but not all imported chemicals. A range of chemicals imported for a broad range of industrial uses is not regulated. There are also areas in the existing framework that needs strengthening. These issues are targeted in Samoa's NIP.

The Lands, Surveys and Environment Act 1989 (LSEAct) is the overarching environmental protection legislation that addresses issues related to hazardous waste management and disposal. The Planning and Urban Management Act 2004 (PUMAct) strengthens environmental protection with stricter environmental planning requirements for all major development activities, and the creation of the planning and PUMA.

Before ratifying the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention) Samoa had issued non-consents for eight POPs pesticides previously imported under its Pesticides Regulation 1990. To date, the Pesticides Regulation constitutes the main legal instrument for regulating the importation of POPs and PTS. The PUMAct defines the framework for planning the use, development, management and protection of land in Samoa. Under the PUMAct, PUMA is empowered to prepare 'sustainable management plans' and prepare 'development standards' in respect of new developments targeted at specific requirements including in relation to the emission of pollution and means for its prevention, control and mitigation. It also provides for environmental impact assessment (EIA) to be undertaken by developers if the Agency deems it necessary. This legal authority therefore bodes well for regulating the presence of POPs and PTS in Samoa.

Two other draft legislations are being considered for passage into law, the MNRE Bill 2003 and the draft EIA Regulations. Once enacted, these will significantly strengthen the legal framework for environmental management. There are however several other legal issues that need to be addressed to bring all hazardous chemicals under effective management. A legal review is proposed that will consider these issues and all available options for the appropriate actions to be taken.

3.2.2 Roles and Responsibilities

The MNRE is responsible for the protection of Samoa's environment and has overall coordination responsibility for the implementation of Samoa's NIP. Within the MNRE the PUMA will be the lead agency.

Activities of the NIP will be implemented by a variety of government agencies and corporations. Others will by necessity be outsourced to private contractors while others still will require the involvement of local NGOs, community groups and educational institutions. The involvement of many agencies and organisations in government and the private sector calls for a multi-sector approach and a mechanism for interagency coordination.

An existing NTT for POPs, currently supporting the GEF-funded Samoa NIP-POPs project, is proposed to assist PUMA with the coordination of inputs from all the stakeholder groups involved. The NTT will be chaired by the Assistant Chief Executive Officer of PUMA, and will meet regularly to monitor progress in implementation, coordinate inputs from different

agencies and organizations, and advice on interagency issues as necessary. Key agencies and organizations of the NTT includes, the Ministry of Health (MOH), Ministry of Agriculture and Fisheries (MAF), Ministry of Commerce, Industry and Labor (MCIL), Ministry of Foreign Affairs and Trade (MFAT), Ministry of Works, Transport and Infrastructure (MWTI), Ministry of Women, Community and Social Development (MWCSD), Ministry for Revenue (MFR), Agriculture Store Corporation (ASC), Electric Power Corporation (EPC), Office of the Attorney General (OAG), Ministry of Police, Prisons and Fire Services (MPPFS), Samoa Ports Authority (SPA), Samoa Water Authority (SWA) National University of Samoa (NUS), University of the South Pacific (USP) in Samoa and the Samoa Umbrella of NGOs.

3.2.3. Relevant International Commitments and Obligations

Samoa is party to the following international conventions related to chemical management, and is obligated to comply with its responsibilities under each convention:

1. Stockholm Convention - signed: 23 May 2001, ratified: 4 February 2002.
2. Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal 1989 (Basel Convention) - acceded 22 March 2002.
3. Convention to Ban the importation into Forum Island Countries of Hazardous and Radioactive Wastes and to control the Trans-boundary Movement and Management of Hazardous Wastes within the South Pacific Region 1995 (Waigani Convention) - ratified: 23 May 2001
4. Rotterdam Convention - acceded: 30 May 2002
5. United Nations Framework Convention on Climate Change 1992 - signed: 12 June 1992, ratified: 29 December 1994; and Kyoto Protocol ratified 15 November 2000.
6. Vienna Convention for the Protection of the Ozone Layer 1972 - acceded: 21 December 1992
7. Montreal Protocol on Substances that Deplete the Ozone Layer 1987. acceded: 21 December 1992; and Amendments¹
8. International Convention for the Prevention of Air Pollution from Ships 1973; as modified by the protocol of 1978 relating thereto 1973 /1978 - acceded: 4 February 2002

3.2.4. Existing Legislation and Regulations Addressing POPs

The Pesticides Regulation 1990 is the main law for regulating the importation of POPs pesticides. Non-consents required under the Rotterdam Convention have been issued to importing parties under this Convention. The Poisons Act 1968 regulates the importation of poisons and toxic substances as defined under this Act.

Several other legislations deal with different aspects of hazardous substances management once they pass through border control. The LSEAct and the PUMAct deal with disposal and environmental monitoring. These and other relevant legislation and their respective areas of responsibilities are indicated in Table 1.

The Table 2 depicts relevant national legislations that can be used to regulate POPs and PTS in Samoa.

3.2.5 Education and Public Awareness needs and gaps

3.2.5.1 Education

The Curriculum Statement for Science, Years 9-12, in Samoa Secondary Schools was recently revised and published in February 2004. Noteworthy is the addition of a strand on 'The World and Beyond' which addresses environmental themes. In addition, the revised

¹ London Amendment (1990); Copenhagen Amendment (1992); Montreal Amendment (1997); and Beijing Amendment (1999)

Note: Governments are not legally bound until they ratify the Protocol as well as the Amendments. Samoa 'accepted' all four Amendments on 4 October 2001; the London, Copenhagen and Montreal Amendments came into force for Samoa on 2 January 2002; the Beijing Amendment is not yet in force.

Year 12 and Year 13 Biology curricula contain an 'Environment' strand addressing issues such as adaptation, conservation and ecosystems. The Organic Chemistry strand of the Year 13 curriculum for Chemistry addresses the issue of environmental problems caused by polythene and PVC products. Tertiary-level chemistry courses, in particular the 3rd year course 'Advanced Environmental Chemistry' offered at the NUS provide technical expertise directly related to POPs and PTS.

The Faculty of Science at the NUS currently offers a Diploma in Environmental Science and a Bachelor of Science degree with the possibility to major or minor in Environmental Science. Another available option for formal education at NUS in environment-related topics is enrolment in individual courses on a non-award basis. This can include courses offered by other faculties in environment-related areas such as Physical Geography, and Health and the Environment. The Faculty of Science does not currently offer short term skills-based training such as offered by some other faculties. However, the capacity is there to organise and run short skills-based training around the skills area of existing staff, given demand and a narrow time frame of June - July and November -January. The possibility of collaboration with MNRE and the SPREP in such short term training has merits and advantages for all three parties and should be explored.

Legislation	Importation	Storage	Transport Distribution & Marketing	Use & Handling	Disposal	Environmental Monitoring
LSEAct					✓	✓
Poisons Act 1968	✓	✓	✓	✓	✓	
Pesticides Regulations 1990	✓	✓	✓	✓	✓	
Food and Drugs Act 1967	✓	✓	✓	✓		
Occupational Safety and Health Act 2002		✓	✓	✓	✓	✓
PUMAct					✓	✓

Table 1: Existing Legislation and respective responsibilities

Relevant National Legislation	Relevant provisions	POPs and PTS
Pesticides Regulation 1990	For non-consent to import agricultural pesticides.	POPs pesticides (aldrin, dieldrin, chlordane, DDT, endrin, heptachlor, mirex, HCB, toxaphene)
Forest Act 1967	Prohibit the causing of forest fires on any land.	Dioxins and furans
LSEAct	Regulate introduction of hazardous substances; maintain air quality	Dioxins and furans
LSEAct	Regulate introduction of hazardous substances	PCBs/PTS
PUMAct	Regulates the amenity of area or place affected by fumes and vapours	Dioxins and furans

Table 2: National legislations and their relevant provisions; for POPs and PTS

Overall, the potential of NUS to contribute to Samoa's capacity in hazardous chemical management is significant. The existing Bachelor of Science degree program with a major in Environmental Science (introduced in 2004) provides a solid foundation in environmental chemistry and biology/ecology that is essential to hazardous waste management. This will offer MNRE, other government agencies and the private sector, a ready source of well trained graduates to serve their increasing needs in this crucial area.

With regard to environmental monitoring, NUS has functioning laboratories but would need additional funding for equipment and chemicals to be able to contribute to any initiatives in this area. An on-going chemical field monitoring program using science students and staff is an area of possible involvement that NUS should consider and where collaboration with PUMA can be of mutual advantage.

The USP School of Agriculture has a Department of Soil Science and Agricultural Engineering that offers formal courses in Fundamentals of Soil Science, Soil Fertility, Plant Nutrition and Soils, and Water and Structures Engineering as part of the Diploma, Bachelor, Masters and PhD degrees in Agriculture. Close collaboration between USP and the Institute of Research and Training in Agriculture facilitates the transfer and dissemination of knowledge and information to users including technical field people, scientists, policy makers, students and farmers.

Other departments at USP offers courses that deal with issues related to the management of agricultural chemicals such as fertilizers and pesticides. These courses include Plant Protection and Pest and Disease Management.

3.2.5.2 Public Awareness

The importance of public awareness and understanding of the threat to public health and the environment pose by POPs and PTS, or hazardous chemicals generally, is pivotal to all efforts aimed at regulating the importation, use and ultimately the elimination of POPs and PTS in Samoa.

In 2003, a survey questionnaire targeting secondary school students found that 21% of students interviewed had learnt of POPs and PTS for the first time through the project's awareness raising activities; such as two national chemicals awareness days, several radio-talkback shows, posters (Figure 6) and a POPs documentary.

After several awareness raising activities conducted from 2002 to 2004, the majority of representatives who participated in activities such as workshops, seminars, and consultations, would like to see more programmes on POPs and PTS brought out to the villages. The people support the objectives of the Stockholm Convention and feel that it is only with the cooperation of each village council that the releases of dioxins and furans can be regulated and monitored in their own respective communities. They also wish to see more of the POPs documentary on Samoa's national television as well as hear more about such issues on the radio.

3.3 POPs Assessment

3.3.1 Introduction

The POPs are a set of chemicals that are toxic, persist in the environment for long periods of time, and characterized by low water solubility and high lipid solubility thus bio-accumulate in fatty tissues as they move up the food chain. Because they are semi-volatile, they circulate globally via the atmosphere, oceans, and other pathways, such that those released in one part of the world can travel to regions far from their source of origin.

Globally, the persistence of these chemicals in the atmosphere and bioaccumulation in fatty tissues has caused detrimental impacts on human health and the environment (UNEP Chemicals, 2003a). For Samoa however, this statement has not yet been proven true, due to the lack of resources and research to determine the above.

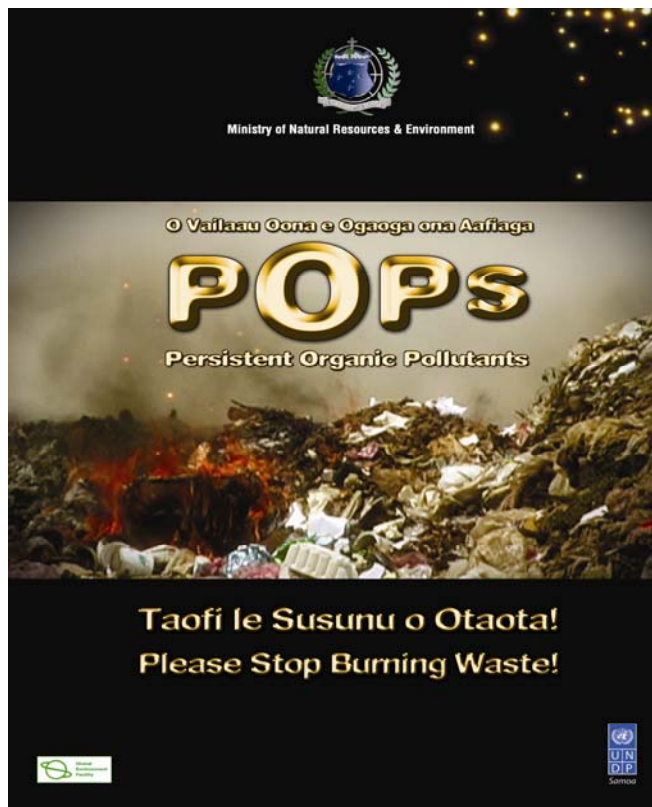


Figure 6: Poster developed to promote the theme of 'Stop Burning Waste' for the third National Chemicals Awareness Day, April 2004

3.3.2 Background

Of the 12 POPs chemicals identified in the Stockholm Convention, eight are present in Samoa with the ninth suspected from the presence of its impurities (Table 3). These include aldrin, chlordane, dieldrin, DDT and heptachlor as pesticides, PCBs as an industrial chemical and dioxins and furans as unintentional introductions. There is also the presence of DDT as an impurity (<0.1%) in Dicofol². HCB is also present as an impurity in chemicals such as chlorothalonil (e.g. Bravo 50), PCP, atrazine, picloram and others.

3.3.3 Production, Import and Use

3.3.3.1 Sources of POPs

Samoa does not manufacture any of the intentionally released substances such as pesticides and industrial chemicals, thus the main source of entry is importation. As for unintentional releases, the main sources are through uncontrolled combustion, such as open fire for cooking and for the burning of rubbish, controlled combustion processes such as incineration, and incomplete combustion from motor vehicle exhausts.

² Despite the presence of DDT as an impurity in Dicofol, current Dicofol usage data indicate that DDT releases to the environment from this source are likely to be small.

Type of POPs	Type of Chemical
1. Aldrin	Pesticide
2. Dieldrin	Pesticide
3. DDT	Pesticide
4. Heptachlor	Pesticide
5. Chlordane	Pesticide
6. PCBs	Pesticide, Industrial chemical
7. Polychlorinated dibenzo-p-dioxins (Dioxins)	By-product
8. Polychlorinated dibenzo-furans (Furans)	By-product
9. HCB	Pesticide, Industrial chemical, By-product

Table 3: Nine of the twelve POPs chemicals found in Samoa

3.3.3.2 Intentional introductions of POPs: Pesticides and PCBs

Samoa does not manufacture any of the pesticides or PCBs identified in the Stockholm Convention while its association with some of the agricultural chemicals go back as early as the 1950's. During this time, dieldrin was used to control the leaf hopper for taro plantations, and beetle borer in banana plantations. Aldrin and chlordane were used for the control of the sweet potato weevil (Laufasi Ola Bulletin, 1956).

Based on the inventories and assessment reports, the POPs and PTS were imported for the following uses.

- Aldrin and dieldrin which are similar compounds were used for crop protection against various soil dwelling pests as well as for termite infestation, by soaking the young banana saplings in the chemicals before planting. The approach was discontinued in the late 1970's.
- DDT was commonly used as one of the mixtures in the puffer for new banana bunches and as health vector spraying for dengue fever in the 1970's. According to MOH, DDT was last used for dengue fever vector spraying in 1974.
- Chlordane was originally used as a pesticide on field crops such as corn and citrus fruits and was later used to control termites in houses and cable phone lines. The last known supplies were with the ASC and IPC in the early 1990s.
- Heptachlor was imported for use as a non-agricultural insecticide for ants and termite control.
- PCBs were imported as part of electrical transformers. The amount of PCB-based transformers imported over the years could not be estimated reliably due to incomplete records.
- The presence of chlorothalonil, picloram, PCP, atrazine, lindane in the ASC list of chemicals (SPREP, 2000) indicated that HCB may also be present in Samoa although analysis has not shown any traces.
- Lindane was imported for pharmaceutical uses for scabies but with alternatives now available, this should be discontinued or phased out.

The lack of records to ascertain the quantities of POPs chemicals imported by the main importers such as the ASC is a constraint to compiling a complete inventory. The recent inventories and survey's (MNRE, 2004b) did not find any pesticide stockpiles while the only indication of past use was obtained from personal communications with people with past direct association with their use or management.

3.3.3.3 Unintentional Introduction of POPs: dioxin and furans

Dioxins and furans are mainly produced from incomplete combustion processes of vehicles and incinerators, industrial processes with no Air Pollution Control Systems (APCS), and open burning (e.g. cooking). According to US-EPA (2000) dioxin can be formed through natural combustion, but the contribution of natural combustion to dioxin levels in the environment is probably insignificant. As shown in Table 4 the inventory of dioxins and furans indicates that major releases within Samoa are from:

- Waste Incinerations: approximately 0.797 gramme (g) TEQ/a is released from fly ash and to air;
- Uncontrolled combustion: approximately 0.445g TEQ/a mainly from open and uncontrolled burning;
- Power generation and Heating: approximately 0.009g TEQ/a with the majority release from domestic heating and cooking;
- Transportation: approximately 0.003g TEQ/a mainly from vehicle and 2 stroke engines emissions;
- Miscellaneous: approximately 0.2 TEQ/a from dry cleaning and tobacco smoking;
- Waste disposal, consumer goods, and metallurgic processes have insignificant releases on an annual basis.

Source	Annual Releases (g TEQ/a)				
	Air	Water	Land	Products	Residue
Waste Incineration	0.797	0.000	0.000	0.000	0.000
Ferrous and Non-Ferrous Metal Production	0.000	0.000	0.000	0.000	0.000
Power Generation and Heating	0.009	0.000	0.000	0.000	0.000
Production of Mineral Products	0.000	0.000	0.000	0.000	0.000
Transportation	0.003	0.000	0.000	0.000	0.000
Uncontrolled Combustion Processes	0.245	0.000	0.020	0.000	0.180
Production of Chemicals and Consumer Goods	0.000	0.000	0.000	0.000	0.000
Miscellaneous	0.000	0.000	0.000	0.000	0.150
Disposal/Landfilling	0.000	0.000	0.000	0.000	0.000
Identification of Potential Hot-Spots					
Total	1.1	0.0	0.0	0.0	0.3

Table 4: Estimated dioxin and furan releases in Samoa

Note: Samoa's estimated annual dioxin and furan releases of about 1.4 g TEQ/a is similar to that of Brunei Darussalam, whose annual dioxin and furan release is 1.401 g TEQ/a. Despite this similarity however, it should be noted that Brunei's population is estimated at 350,000 while Samoa's population is 169,000. Clearly, this means that Samoa has a higher release of Dioxin and Furans on a per capita basis.

Other countries that used the UNEP Standardized Toolkit method have estimates of annual releases higher than Samoa. They include Uruguay (28g TEQ/a), Jordan (142.2g TEQ/a), and New Zealand (14-51g TEQ/a for air only). Nevertheless, complacency in reducing dioxins and furans could pose some impacts in the future if appropriate Best Environmental Practices and Best Available Technology options are not used for waste incineration and transport in particular.

3.3.4 Levels and Trends

3.3.4.1 Intentional releases of POPs: Pesticides and PCBs

The levels of pesticides releases in Samoa varied throughout the years, with the last major releases of DDT, dieldrin and aldrin occurring between the 1950s to the 1970s. Heptachlor

and chlordane had confined uses for termite spraying up to the early 1990's and is assessed to have limited nation-wide contamination. The presence of only five PCBs contaminated transformers above acceptable levels denotes the limited spread of contamination nationwide (see Table 5 for the levels and trends of POPs and PTS in Samoa).

Since POPs pesticides and PCBs are no longer consented for importation into Samoa, intentional releases into the environment is effectively curbed, except when they are imported illegally. Therefore current levels of contamination, which are very confined and localized for soils, are expected to decrease over the years, especially if the highly contaminated areas can be cleaned and disposed or sealed from further contact by humans or animals.

The current levels of bioaccumulation for DDT, dieldrin, and PCB in fatty tissues for animal fat, humans and marine sediments is assessed to be considerably lower than levels of concerns for human health and environment. However, although the levels are low, the persistent nature of these chemicals requires the continued testing of breast milk and pig fat samples so that POPs and PTS presence and levels are recorded for monitoring purposes. These levels will continue to decrease over the years as long as no new chemicals containing the same active ingredients are released into the environment.

For some of the marine sediments where high concentrations of try-butyl-tin have been found, it is anticipated that an increasing trend will continue due to the high level of use of the Apia harbor and wharf by visiting ships, yachts and other vessels as the main seaport of entry into the country. Try-butyl-tin levels should be routinely monitored within the harbor so that toxicity levels can be made public, especially as several families still fish within this area.

3.3.4.2 Unintentional releases of POPs: dioxin and furans

The current releases from dioxin and furans are low compared to other countries of the world, but greater on per capita and land area bases. Based on the precautionary principle, actions need to be taken now to reduce their accumulation in the soil and water and their bioaccumulation in animals.

3.3.5 Stockpiles

To date, the only stockpiles of POPs found in Samoa are from electric transformers with PCB. A complete assessment of PCBs is not possible due to some of the transformers still being used. To date, however, only five transformers have been confirmed to have PCBs. The obsolete transformers and those taken for repairs are tested using the PCB quick test method (Clor-N-Oil 50, PCB Screening Kit (EPA Method 9079). Samples of the transformer oils that test positive are then sent overseas for analysis and confirmation. Transformers with PCB are then placed in the allocated stockpiles at the EPC Vaitele depot.

Buried stockpiles of obsolete chemicals were noted at the Nuu Research station but there is no authoritative verification of the specific chemicals involved. The types of chemicals buried were based on the recollections of some staff in the absence of any documentation (Burns et al., 2000). Additionally, analyses of sampling taken from the disposal sites show very low levels of heptachlor contamination.

3.3.6 Contaminated Sites

Of the sites selected and analyzed for the POPs assessment, only five are considered as high priority for immediate remediation based on the extreme high levels of soil contamination. Three of the sites are contaminated with POPs chemicals, one is a mixture of POPs and PTS, and the fifth is contaminated with PTS only.

POPs	Use	Amounts	Current status	Levels	Trends
Aldrin	Banana plantations	Moderate	Non-consent for import since 1998	1. Widely used in banana plantation up to the 1970's 2. No known contamination or stockpile	1. No new releases into the environment 2. Soil erosion could result in bio-accumulation in aquatic and marine organisms
Chlordane	Termite control	Low	Non-consent for import since 1993	Contamination in only two storage sites (ASC Vaitele and IPC Vaivase)	1. No new releases into the environment 2. Possible contamination at homes sprayed with chlordane 3. Localized contamination can be eliminated with clean up
DDT	Banana plantation Vector control	Widely used in banana plantations, and in homes	1. Non-consent for agricultural use since 1993 2. Last import of DDT-formulated mosquito coils in 1994	1. Contamination at ASC Vaitele facility, and some old plantations 2. Low level detection in pig fat, marine organisms tested 3. Very low levels of DDT in humans possibly from past use or imported food and other products	1. Possible increase in food chain bioaccumulation from existing low levels in marine organisms from Vaiusu Bay and domesticated pigs 2. Decreasing levels of presences in humans due to the absence of any new releases
Dieldrin	Banana plantations	Widely used in banana plantations	Non-consent for import since 1998	1. Widely used for banana plantations 2. Confined contamination in two confirmed sites 3. Presence in marine organisms	1. No new releases into the environment 2. Decrease of bioaccumulation in food chain
Heptachlor	Termite control	Low	Non-consent for import since 1994	1. Very low and confined use for termite control 2. Contamination only at ASC Vaitele compound and IPC Vaivase	1. No new releases into the environment 2. Possible contamination at homes sprayed with chlordane
PCB	Electrical transformers	Low	Importing countries do not produce PCB transformers anymore	1. Unknown number of imported transformers with PCB 2. Three contaminated sites (EPC Vaitele, Salelologa and SFC Asau)	1. No new imported transformers containing PCBs 2. Contaminated sites are sealed and planned for disposal, therefore pose limited risk to the environment and human health
Polychlorinated dibenzo-p-dioxins/ Polychlorinated dibenzo-furans	Produced from combustion processes and burning	Moderate	Produced from combustion processes and burning with low levels from other processes	1. Emissions are low compared to other countries 2. Highest releases from biomass burning and incinerators	1. Considerable decrease in future when new (and upgraded) incinerators with good APCS are installed 2. Implementation of waste management strategy
PTS					
Total Petroleum Hydrocarbons/ Polynuclear Aromatic Hydrocarbons	Oil waste	Low		Presence at the main bulk storage oil facility	Will be reduced when good oil management plans are installed for waste oil disposal
TBT	Anti-fouling for boats	Low	No anti-fouling done in the country	Presence in marine sediments from main Matautu Wharf	Could continue to be present in the area due to high traffic use of the area, although no anti-fouling is done in country
Copper-Chrome-Arsenic/PCP	Timber treatment	Moderate	Not used anymore	The SFC site in Asau is the only area that has significant presence which should be a priority contaminated site for clean up	Clean up of SFC site will eliminate future contamination
Lindane	For scabies	Low	Non-consent for import since 2000 when alternative was identified	Found as degradation product beta-HCH in breast milk samples	Used for medical purposes only

Table 5: POPs and PTS in Samoa

The high priority sites are much localized and of very small areas, with the areas having the highest concentration of contaminants usually less than 25 square meters and less than 2m in depth.

- The ASC's Vaitele compound: the area shows contamination from a mixture of chemicals including chlordane and heptachlor. Chlordane showed the most contamination which is around 10 times above recommended levels for commercial sites. The contamination has reached 1.5m depths and shows to cover around 25m square around the old docking bay to the storeroom (Figure 7). The major concerns at this site related to the risk of contamination of workers at the compound including night watchman whose cookhouse is less than 10m from the contaminated area, whose chickens forage over the contaminated site. Immediate actions will need to be done to stop access of the area by both humans and animals, and for remediation actions to be carried out as soon as possible.
- The IPC facility in Vaivase shows contamination of chlordane, heptachlor, and heptachlor epoxide. The levels do not exceed those of commercial areas, although total chlordane is more than 7 times above the recommended levels for residential areas (Figure 8). The concern is due to the close proximity of the contaminated site to family residences. Possible actions will be to seal off the contaminated site while a plan for possible disposal is implemented.
- The SFC Asau old timber treatment facility showed arsenic acid concentrations exceed the guidelines by up to 30 times. Copper and chromium III concentrations are also significantly elevated; however the levels of these determinants are either within the guidelines or are not considered a major health risk given the current land use (Figure 9). All samples exceed the acceptance criteria set for agricultural land use purposes, as listed in the New Zealand timber treatment guidelines.
- William Arp's storage and handling facility in Moamoa show elevated levels of dieldrin and DDT. Families now occupy this area and are at serious risk of contamination.
- The EPC depot, Vaitele, although not having much PCB contamination in soil samples taken, it is considered a potential contaminated site as pre-1987 transformers continue to be brought in for decommissioning and testing (Figure 10).

Other sites were also found to be contaminated but below levels that would pose a concern for human health and the environment. Nevertheless, some actions need to be taken to ensure that future exposure is eliminated. These include:

- Vaiusu Bay and Matautu wharf
The two sites showed high levels of dieldrin, and DDT as well as try-butyl-tin and some other heavy metals (Figures 11 and 12). Due to the limited size of samples collected, the results are only preliminary until further investigation.
- Nuu Agricultural Research Station
Heptachlor was detected at a disposal site at the Nuu Agricultural Research Station in one sample with the level of contamination below recommended guideline levels.
- A decommissioned timber treatment plant at Asau
SFC Asau's decommissioned timber treatment plant had PCB-contaminated oil in one old transformer.



Figures 7 (left): Chlordane- and heptachlor- contaminated soils at the ASC compound, Vaitele, and Figure 8 (right): At the IPC yard, Vaivase



Figures 9 (left): Copper-chrome-arsenic contamination at the SFP, Asau
Figure 10 (right): Transformers including PCB -contaminated at EPC depot, Vaitele



Figure 11 (left): PTS-contaminated marine and try-butly-tin-contaminated sediments at Apia wharf;
Figure 12 (right): Polynuclear Aromatic Hydrocarbons-contaminated mangrove swamp at Sogi

4. STRATEGIES AND ACTION PLANS OF THE NATIONAL IMPLEMENTATION PLAN

4.1 Policy Statement

Improving the quality of life of all Samoans is of paramount importance. Samoa is committed to pursuing this goal based on a competitive economy with sustained economic growth, improved education, enhanced health standards and strengthened cultural and traditional values.

POPs and PTS constitute a threat to the health of Samoa's people and the natural environment that supports its economic growth and prosperity. As a party to the Stockholm Convention on POPs, Samoa is committed to the effective and timely reduction and elimination of POPs and PTS, other than exemptions.

The Government of Samoa recognizes and endorses this NIP as its blueprint of action for achieving the goal of this policy. The NIP also recognizes the importance of stakeholders' roles in achieving this goal.

4.2 Implementation Strategy

The implementation of the NIP will involve many sectors, and will engage several government agencies, institutions and non-governmental organizations. This multi-sector approach calls for an effective mechanism to facilitate collaboration and a strong and well-resourced coordinating body to have overall responsibility.

The PUMA will have overall coordination of the POPs-NIP implementation. A Chemicals Management Unit(CMU) comprising of a Project Coordinator and support staff is proposed to be established within PUMA to perform this function.

The NTT for POPs will continue to function as the mechanism for interagency collaboration. This mechanism was set up to assist PUMA in coordinating the formulation of the NIP. It needs to be strengthened further with the inclusion of other key stakeholders currently not represented. The NTT will be chaired by the Assistant Chief Executive Officer of PUMA and will meet regularly to review progress reports on implementation, advise PUMA as necessary and assist with coordinating inputs from different stakeholder organisations.

Other specialized technical committees will be formed and convened as deemed necessary by PUMA and NTT to deal with specific issues. This is envisaged in key areas such as pesticides, and chemicals currently imported unregulated for general industrial use.

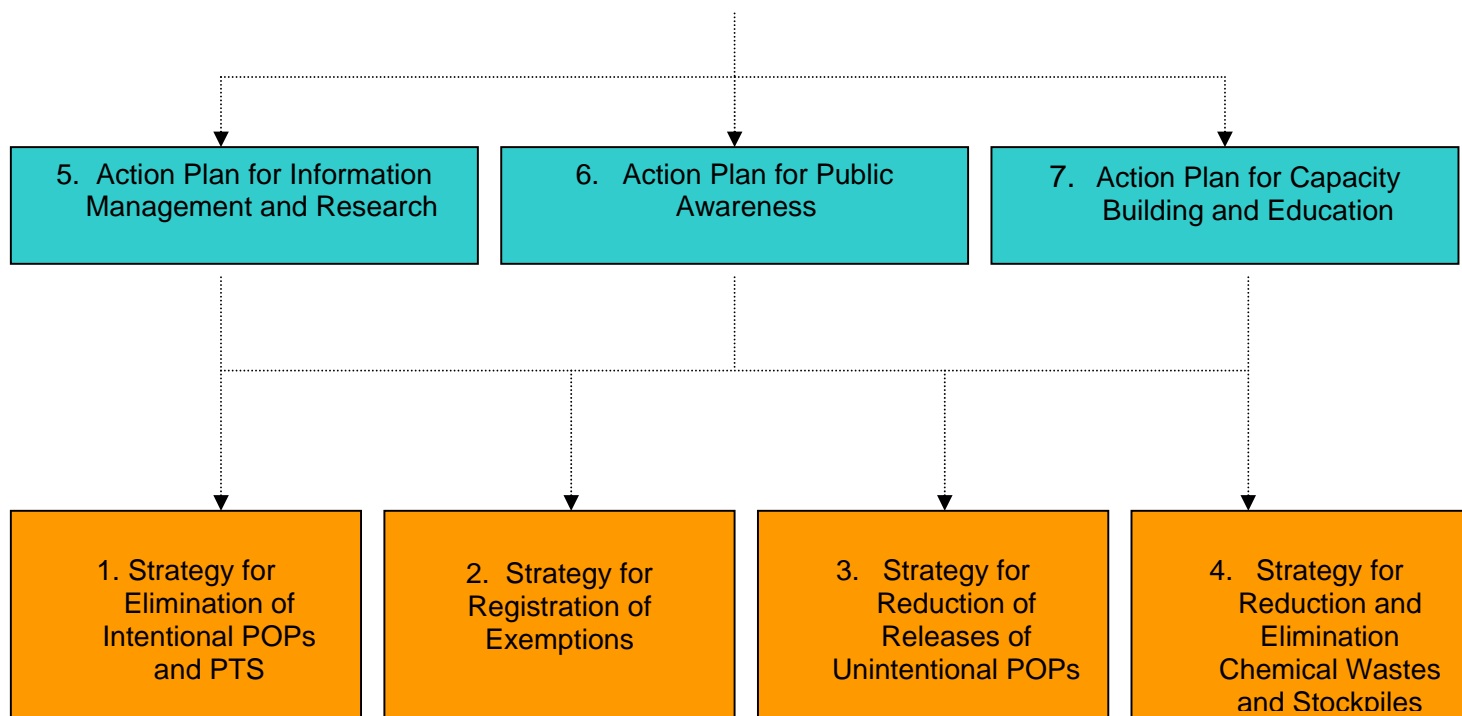
The Implementation of specific activities will involve:

- Different agencies with relevant mandates under PUMA's overall coordination e.g. all pesticides regulatory work to remain under MAF with its Pesticides Registrar directly responsible. PUMA is also expected to play the leading role in several key activities;
- Local institutions and NGOs (e.g. NUS, O le Siosiomaga Society);
- Regional institutions and organisations (e.g. SPREP,USP);
- Private contractors and consultants; and
- Local communities, women's and youths groups and schools.

It is important to work closely with local communities (women groups, youth groups, local schools, farmers, untitled men, chiefs and village councils) to raise general awareness on POPs and to obtain their support to reduce the potential adverse impacts of POPs and PTS.

4.2.1 Flow Diagram of NIP Strategy and Action Plan Inter-linkages

The flow diagramme below shows that the Action Plan for National Coordination and consultation is the overarching plan of the NIP, with three other Action plans that also have a cross-cutting effect. The specific inter-linkages are to the remaining Strategies, i.e. those for exemption, elimination of intentional POPs, reduction of unintentional POPs, and elimination of chemical wastes and stockpiles. Inter-linkage of exemption with awareness, and capacity building and education would await preparation of submission for exemption.



4.3 Strategies and Action Plans

The NIP consists of several specific strategies and action plans each targeting different objectives. The objectives of each Strategy and Action Plan reflect those of the Stockholm Convention on POPs, thus establishing a direct link between Samoa's obligations under the Convention and the actions proposed in the NIP for their achievement.

The following Strategies and Action Plans define the objectives, targets and key actions proposed for Samoa's NIP:

4.3.1 Strategy for the Elimination of Intentional POPs³ and PTS

Introduction

Samoa has effectively implemented several measures to reduce and eliminate the intentional releases from pesticidal and industrial POPs⁴. Specifically, most pesticidal POPs identified in the Convention have over the last few years been non-consented for importation under the related Rotterdam Convention. Electrical transformers containing PCBs have been phased out by most importing countries and Samoa, through the EPC, has discontinued their further importation. Furthermore, EPC is actively testing old (pre-1987) transformers to identify those containing PCBs for decommissioning and disposal.

Building on these actions, this strategy aims to strengthen the existing regulatory frameworks and the capacity of relevant border-control agencies to stop further POPs importation.

Objective

To reduce and eliminate the import, use and release of intentional POPs and where appropriate PTS in Samoa

Target

All intentional production (including importation) and releases to be eliminated in line with the Stockholm Convention Article 3.

Actions

1. Legislative frameworks to ban POPs chemicals and regulate importation of industrial chemicals
 - a. Review chemical related legislation to address legal issues identified in the ICA report.
 - b. Develop a national policy for the management of toxic chemicals and wastes for Samoa taking into account the above review.
 - c. Enact the MNRE Bill as a matter of priority.
 - d. Provide an enabling environment to support the enforcement of existing legislation, in particular the Pesticides Regulation 1990.
2. Strengthen capacity of institutions and agencies responsible for regulating chemical management.
 - a. Develop and implement protocols that require importers of chemicals to disclose the list of active ingredients with products and imported chemicals to facilitate the monitoring of POPs imported under different trade-names.
 - b. Train border control officers to effectively apply monitoring protocols regulating POPs importation.
 - c. Regulate the import of properly labeled products in line with international trading standards and practices.

³ POPs includes PTS where appropriate throughout

⁴ Includes PTS where appropriate throughout

4.3.2 Strategy for the Registration of Exemption

Introduction

While DDT is one of the 12 banned POPs chemicals under the Stockholm Convention, under Article 4 of the Convention, Parties are allowed to register for one or more types of specific exemptions for the continued use of specific POPs chemicals where there is a justifiable need that cannot be substituted by another non-POPs chemical. The use of DDT for disease-vector control spraying is one such need.

Samoa must apply for an exemption for the continued importation and use of DDT for disease-vector spraying. This exemption is precautionary in nature, to preserve for Samoa this option should it need it in the future in the event of an imminent threat of malaria, or possibly dengue. The exemption is further justified by the lack of other alternatives to DDT for this purpose.

Objective

Register for DDT exemption for disease vector control.

Target

Registration of exemption for DDT by end of 2006

Actions

1. Registration of exemption for DDT by end of 2006.
 - a. Prepare and transmit appropriate written notification and other reporting requirements to the Secretariat to request and register Samoa's exemption for DDT.
 - b. Prepare and submit a report to the Secretariat and the WHO after 3 years of exemption, as required under Annex B Part II of the Stockholm Convention.
2. Obtain information on alternative non-POPs to exemption.
 - a. Seek from the Secretariat and WHO the alternatives, other than the 4 currently used, to exemption.

4.3.3 Strategy for the Reduction of the Releases of Unintentional POPs

Introduction

Samoa releases, unintentionally, an estimated 1.4g TEQ/a of dioxins and furans into the atmosphere. This is considered low compared to developed and most other developing countries. The releases will continue to increase if actions are not taken now to reduce them in areas where alternatives or best environmental practices or technology are available.

Consistent with the objectives of the Stockholm Convention and to minimise any potential risks to human health and the environment, Samoa will actively implement the following actions to reduce dioxins and furans releases by 20% by 2010.

Objective

To reduce releases of from unintentional POPs.

Target

The releases from POPs unintentionally produced are reduced by 20% of 2003 levels by 2010.

Actions

1. Regulatory frameworks to promote the reduction of unintentional releases of dioxins and furans from incomplete combustion processes, such as internal combustion engines and power generation plants
 - a. Set emission standards for motor vehicles and power generation plants.
 - b. Enact national legislation to enforce emission standards for all vehicles and power generation.

- c. Conduct public awareness activities to promote new standards amongst importers of motor vehicles and the general public.
 - d. Develop local capacity (including institutions) to test all imported vehicles for compliance with new emission standards.
 - e. Monitor the impacts on reduction of releases for meeting the proposed target with links to the following actions (see action 4 below)
 - f. Technology to be sought with reduced releases of unintentional POPs, (e.g. fuel efficient stoves).
2. Improve APCS for all major technologies.
 - a. Develop and implement a programme for upgrading and/ or replacing all existing public and private incinerators with cleaner technology or incinerators with effective APCS.
 - b. Industries to be encouraged to improve APCS.
 3. Implement actions of the waste management strategy which supports separation of higher dioxin releasing chemicals
 - a. Initiate actions to promote the separation of waste materials, which generate unintentional POPs from open burning.
 - b. Promote composting as an alternative to burning organic materials, including waste.
 - c. Promote efficient waste collection and disposal facilities to reduce burning wastes.
 - d. Promote reuse and recycling of plastics including packaging/ containers, and reduce use of non bio-degradables.
 - e. Conduct an awareness campaign to stop burning wastes to reduce unintentional POPs.
 4. Further assess and monitor the releases of dioxins and furans
 - a. Undertake further assessment of releases of dioxins and furans.
 - b. Develop and implement a programme for the long term monitoring of dioxin and furan bioaccumulation in human tissues and environment
 - c. Monitor and research the impacts on reduction for meeting the proposed target with links to the above 3 actions.

4.3.4 Strategy for the Reduction and Elimination of Chemical Wastes and Stockpiles ***Introduction***

Samoa's inventory of POPs and PTS identified several contaminated sites which require immediate cleanup and or management. There are also stockpiles of POPs and PTS that were put together earlier under an AusAID/SPREP regional initiative. The stockpiles are earmarked for shipment to and destruction at an Australian facility by about the end of 2004. The contaminated sites are targeted for clean-up as part of Samoa's NIP implementation. This strategy prescribes the relevant measures for putting this into operation.

Objective

Reduce and eliminate releases from stockpiles and chemical wastes

Target

All hazardous wastes, stockpiles and contaminated sites have been identified and disposed of and/ or remediated by 2010.

Actions

1. Develop and implement a programme for the disposal of stockpiles and the cleaning up of contaminated sites:
 - a. Identify potential disposal sites for Upolu and Savaii.
 - b. Develop selected disposal sites to enable the safe disposal of hazardous chemical wastes.
 - c. Implement clean-up and management plans for identified contaminated sites.

- d Facilitate and support the earliest implementation of the AusAID/SPREP-POPs/PTS disposal project that will remove existing stockpiles of POPs and PTS for destruction in Australia.
 - e Enforce Waigani/Basel Conventions for trans-boundary movement of waste, and use Rotterdam Convention article requiring identifying transit of hazardous chemicals under the Rotterdam Convention.
2. Initiate capacity building programmes for clean up and management of contaminated sites:
 - a Train staff in the safe handling and disposal of hazardous chemicals.
 - b Procure appropriate safety gear and essential equipment.
 - c Promote public awareness of the disposal sites, and of clean-up activities requiring public knowledge, participation and support.
 - d Secure the contaminated sites to minimize releases pending their remediation.
 3. Identify other POPs contaminated sites and media and implement appropriate remedial actions.
 - a Develop and implement a long term testing strategy for pre-1987 electrical transformers.
 - b Conduct testing of all sites suspected for possible contamination with POPs and PTS including dieldrin, DDT and others.
 - c Review NIP to incorporate findings and actions needed to address results of research and testing strategies.
 - d Enforce a permit system to import chemicals, especially industrial (including development).

4.3.5 Action Plan for Information Management and Research

Introduction

The lack of information regarding past importation and use of chemicals into Samoa was a constraint to determining what POPs chemicals were present in Samoa's environment. It is important that henceforth, relevant information is well recorded and maintained. Timely exchange and access to up-to-date information amongst agencies such as the MAF, MOH and the MFR is essential to the effectiveness of border-control agencies. Similarly, monitoring and testing for PCBs-contaminated transformers requires the close collaboration and exchange of data and information between EPC, MNRE, MOH and several other agencies.

There are also several gaps in information and knowledge that can only be addressed through systematic and science-based research activities. Not only should these be addressed through a properly designed and executed research program, but the management of new knowledge and information to be generated must reflect a commitment to application, in sharing information with relevant implementers, and their use to update the NIP.

Objective

Impacts of hazardous chemicals (including POPs and PTS) on the health of Samoa's population and its environment are better understood.

Target

POPs-related research program and an efficient information management system is in place by 2010.

Actions

1. Develop a national clearinghouse facility for information management and sharing to monitor POPs and PTS' chemicals movements and status:
 - a. Support the development of compatible databases between agencies and relevant institutions.

- b. Facilitate the sharing of data and information between agencies and institutions electronically and through the NTT.
2. Initiate a programme of continued monitoring of potential contaminated sites and stockpiles:
 - a. Design and implement an on-going program of environmental monitoring of POPs and PTS, targeting suspected sites and media.
 - b. Conduct training for relevant personnel and agencies to be involved in the monitoring programme.
 - c. NGOs are to link internationally for concern about such local sites and stockpiles.
3. Initiate research to determine the full extent and possible impacts of the current POP's bio-accumulation in animal and human tissue:
 - a. Design and implement a long term study on bioaccumulation of POPs in animal and human tissues.
 - b. Conduct epidemiological studies for possible impacts of dioxin and furans on human health.
4. Strengthen long term multi-sectoral collaboration on the management of chemicals:
 - a. Support the NTT to coordinate the NIP Implementation phase.
5. Support institutions research:
 - a. Institutions are to be supported in conducting research on POPs/PTS and other relevant chemicals and their impacts on human and environmental health.

4.3.6 Action Plan for Public Awareness

Introduction

Human health is at risk with the continued presence of POPs and PTS chemicals. This fact is not well appreciated by many people many of whom had been exposed directly to several POPs pesticides when they were considered harmless and necessary for agricultural purposes in the past. There is also lack of awareness of impacts of unintentional POPs.

It is essential that the public at all levels is made aware and informed of the risk of POPs and PTS and of how they may be best protected against contamination. The success of the NIP is at the same time dependent on the support and participation of some sectors of the community in areas including the identification of potentially contaminated sites, the management of known contaminated sites, the collection of contaminated containers and their safe disposal or management. Communities are to be encouraged to participate in awareness activities including their specific requests and follow up within the communities.

Objective

Raise community and/ or public awareness and understanding of POPs and PTS.

Target

Public awareness in Samoan as well as English is raised at all levels with public actively participating in NIP implementation by the same time.

Actions

1. Public awareness of contaminated areas.
 - a. Implement public and community awareness activities about contaminated sites. These include workshops, seminars, media, and signboards.
2. Public awareness of the environmental and health impacts of POPs and PTS.
 - a. Engage schools, villages and church groups (including women and youth groups) to raise awareness of POPs and PTS and their environmental and health impacts
 - b. Develop awareness raising information material (leaflets, T-shirts, posters) in both the Samoan and English languages and distribute them widely to schools and local communities.
 - c. Encourage other initiatives such as competitions
3. Public awareness of legal mechanisms and institutional arrangements for the NIP:

- a. Promote public awareness of legal mechanisms and processes for obtaining permits to import pesticides and other potentially hazardous chemicals, using TV, radio and newspaper media
- 4. Public awareness of the POPs NIP
 - a. Promote awareness of and support for the NIP in all sectors of society.
- 5. Promote and utilize local knowledge of non-POPs producing alternatives
 - a. Promote public awareness of such alternatives.

4.3.7 Action Plan for Capacity Building and Education

Introduction

Samoa's technical and financial capacity to deal effectively with the reduction and elimination of POPs is limited. Capacity building is an essential prerequisite to the effective implementation of its NIP.

Capacity building and education for POPs will target key agencies directly involved in import regulation, monitoring, education and project coordination. The strengthening of local capacities involves the provision of specialised training for key personnel, provision of equipment and supplies, the procurement of additional staff personnel and operational resources, and education.

Community organisation capacities should be built up to facilitate awareness and enforcement of legislation and village council decisions.

Objective

Improve Samoa's capacity to effectively implement all areas of its NIP.

Target

Samoa's capacity to effectively implement its NIP is enhanced through effective capacity building initiatives within MNRE and other relevant stakeholders who play an integral role in the implementation, monitoring and enforcement of NIP by 2010.

Actions

1. Strengthen national capacity for border control:
 - a. Improve capacity of border control agencies (Customs and Quarantine) to access and share up-to-date information on registered chemicals, importers etc.
 - b. Strengthen the capacity of the Office of the Pesticides Registrar through the provision of training, computer equipment and additional staff.
 - c. Illegal traffic is to be minimised by efficient border control.
2. Strengthen national capacity for hazardous chemical management/ environmental monitoring capacity of relevant agencies and organizations:
 - a. Support the strengthening of environmental science education at the NUS including capacity of in-service teachers.
 - b. Develop the capacity of appropriate local institutions (e.g. MOH) to perform chemical analyses and other technical scientific tests to support the POPs and PTS monitoring programme.
 - c. Provide specific training in chemical monitoring and in field testing techniques for POPs and PTS chemicals.
3. Develop Curricula from primary to tertiary levels:
 - a. Curricula modules for POPs and hazardous chemicals are to be developed for all levels in the formal education system.
4. Strengthen PUMA's capacity to coordinate the implementation of NIP.
 - a. Develop the CMU within PUMA for the NIP and chemical-related Conventions.
 - b. Secure funding to enable the establishment of a CMU – the recruitment of key personnel and the procurement of needed equipment, supplies and other essential resources.

4.3.8 Strategy for National Coordination and Consultation

Introduction

The multi-sector nature and scope of the activities of the NIP invariably demands the involvement of different agencies, private sector operators and NGOs. The inputs of these players need to be coordinated to ensure efficiency, non-duplication and proper integration. This calls for the creation of a coordinating mechanism. One such mechanism already exists in the form of the NTT for the GEF-funded POPs project, under the leadership of MNRE-PUMA. It is logical to build on this mechanism and on the existing arrangements governing its operation to support and promote inter-agency collaboration in the implementation of the NIP.

Objective

NIP implementation is effectively coordinated with the full participation of all relevant agencies and organisations.

Target

NIP implementation is coordinated with the active involvement of key stakeholders within year 1 of NIP implementation.

Actions

1. Strengthen multi-sectoral collaboration in support of the NIP implementation:
 - a. Establish the NTT for POPs as the official interagency mechanism to promote and support NIP implementation. Appoint additional members, including the MCIL from relevant agencies not currently represented.
 - b. Establish a technical expert's support team as a sub-committee of the NTT to advise the NTT on technical issues.
 - c. Ensure that the NTT meets regularly and is active in monitoring and providing guidance for the effective implementation of the NIP.
 - d. Information and communication technology (ICT) is to be used to strengthen collaboration.
2. Ensure Samoa's effective participation in Stockholm Convention-related conferences and meetings.
 - a. Coordinate effectively the active participation of appropriate representatives at regional and international meetings related to the Convention.
 - b. Ensure the timely compilation and submission of national communications and reports.
 - c. Strengthen Samoa's involvement in the various working groups of the Convention.

4.4 National Implementation Framework

This NIP framework following from the previous section's Strategies and Action Plans continues from the Objective, Action and Activities for each with the addition of performance indicators and implementing agencies.

Implementation of specific activities will involve different agencies and relevant stakeholders mandates under PUMA's overall coordination. For example, all pesticides regulatory work to remain under MAF, with the Pesticides Registrar directly responsible. Other implementing agencies include:

- Government Ministries
- Local institutions and NGOs
- Regional institutions and organizations including SPREP and USP;
- Private contractors and consultants, and
- Local communities, women's and youth groups and schools.

Samoa's strategy for monitoring the NIP provides a clear and concise process on how MNRE and the NTT intend to monitor the performance of the NIP in relation to resource mobilisation, inter-agency coordination, networking, information management, regulation enforcement, in-house chemical management of border control agencies, and institutional capacities of agencies to fulfil their role.

More specifically, performance indicators are given below for each of the activities in the strategies and action plans as a means of measuring the individual performance of MNRE and partner agencies in achieving their assigned roles and responsibilities. The monitoring process would ensure ample time to deploy corrective measures and support should agencies encounter difficulties. Under the Strategy for National Coordination, the NTT including Sub-committees, and the proposed technical experts support team is to be strengthened to fulfil the above role.

Surveys and questionnaires would be used as tools for indicating the level of performance, as is currently used for Government's review of Samoa's Development Strategy 2005-2007 expected for the end of that period. Regular reporting of performance in all areas would continue, e.g. monthly to agencies and NTT, quarterly reports to the UNDP and annual to Government and UNDP. Resource management may arguably be the most important as there is proposed a greater mix of resources than during the current GEF/UNDP-implemented enabling activity for POPs.

4.4.1 Strategy for the Elimination of Intentional POPs and PTS

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
All intentional production (including importation) and releases to be eliminated in line with the Stockholm Convention, i.e. Reduce and eliminate the intentional production and release of POPs (<i>Article 3</i>)	Legislative frameworks to ban POPs chemicals and regulate the importation of industrial chemicals	Review chemical related legislation to address legal issues identified in the ICA Report.	A legal review is completed and major recommendations implemented.	PUMA, OAG, NTT
		Develop a national policy for the management of toxic chemicals and wastes for Samoa, taking into account the above review.	National Policy is approved by Cabinet.	OAG, MNRE, MOH, MAF, NTT, mayors, NGOs
		Enact the MNRE Bill as a matter of priority.	MNRE Bill becomes law.	PUMA, OAG
		Provide an enabling environment to support the enforcement of existing legislation in particular the Pesticides Regulation 1990	Illegal importations of non-consented chemicals are stopped.	PUMA, MAF, MFR (Customs)
Strengthen capacity of institutions and agencies responsible for regulating chemical management		Develop and implement protocols that require importers of chemicals to disclose the list of active ingredients with products and imported chemicals to facilitate the monitoring of POPs imported under different trade-names	Protocols are developed and used.	MNRE, NTT, OAG
		Train border control officers to effectively apply monitoring protocols regulating POPs importation	Number of border control officers trained in the use of protocols.	MOA, MNRE, MFR (Customs)
		Regulate the import of properly labeled products in line with international trading standards and practices.	Imported food produce and other products showing chemical analyses results on labels.	MFAT, MOH, MNRE, MCIL, OAG

4.4.2 Strategy for the Registration of Exemption

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
Registration of exemption for DDT by the end of 2006 <i>Registration of exemptions (Article 4)</i>	Registration of exemption for DDT by end of 2006.	Prepare and transmit appropriate written notification and other reporting requirements to the Stockholm Convention Secretariat to request and register Samoa's exemption for DDT	Exemption for DDT is registered	MNRE, MFAT, MOH
		Prepare and submit a report to the Stockholm Convention Secretariat and the WHO after 3 years of exemption, as required under Annex B Part II of the Convention	Report submitted as required to Convention Secretariat and the WHO after 3 years of exemption	MNRE, MFAT, MOH
	Obtain information on alternative non-POPs to exemption.	Seek from the Secretariat, WHO, et al. alternatives, other than the 4 currently used, to exemption	Information obtained and decision on exemption or otherwise.	MNRE-PUMA, MOH, NTT

4.4.3 Strategy for the Reduction of the Releases of Unintentional POPs

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
<p>To reduce releases of unintentional POPs.</p> <p><i>Reduce and eliminate releases of dioxins and furans from unintentional production (Article 5)</i></p>	Regulatory frameworks to promote the reduction of unintentional releases of dioxins and furans from incomplete combustion processes, such as from internal combustion engines and power generation plants.	Set emissions standards for motor vehicles and industries (e.g. power generation plants)	Vehicle and power generation emission standards set and approved.	PUMA, MOH, MNRE, MWTI
		Enact national legislation to enforce emission standards for all vehicles and local industries power generation	Legislation to enforce emission standards is enacted.	OAG, MNRE-PUMA, NTT, MOH, MWTI
		Conduct public awareness activities to promote new standards amongst importers of motor vehicles and the general public.	Number of public awareness activities implemented.	MWTI, MNRE-PUMA
		Develop local capacity (including institutions) to test all imported vehicles and power generation plants for compliance with new emission standards.	Number of local personnel trained; appropriate equipment procured to perform emission tests for vehicles.	MWTI, MNRE-PUMA
		Monitor the impacts on reduction of releases for meeting the proposed target with links to the following actions	Review after 3 years and final report after 5 years.	MNRE, EPC, MWTI, NTT
		Technology to be sought with reduced releases of unintentional POPs, (e.g. fuel efficient stoves)	Reports to NTT of finds and adoption.	MNRE, EPC, MWTI, MCIL, NTT
	Improve APCS for all major technology, e.g. incinerators and industries	Develop and implement a programme for upgrading and/ or replacing all existing public and private incinerators with cleaner technology or incinerators with effective APCS.	Incinerators at Motootua and Tuasivi Hospital, Faleolo Airport and Matautu Wharf are upgraded to use cleaner technology.	MNRE, MOH, OAG, MAF, SPA, Samoa Airport Authority
		b. Industries to be encouraged to improve APCS.	Numbers of improved APCS.	MNRE, MCIL, SAME, COC

4.4.3 Strategy for the Reduction of the Releases of Unintentional POPs (cont'd)

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
	Implement Actions of the Waste Management Strategy which supports separation of higher dioxin releasing chemicals	Initiate actions to promote the separation of waste materials, which generate unintentional POPs from open burning	Appropriate actions are implemented.	MNRE-PUMA, MOH, MPPFS,, MAF, MWCS D
		Promote composting as an alternative to burning organic materials, including waste	Numbers of units installed and usage.	MNRE-PUMA, MWCS D, MAF, NTT, farmers
		Promote efficient waste collection and disposal facilities to reduce burning waste.	Survey of penetration rate and access to collection facilities.	MNRE-PUM, NTT
		Promote reuse and recycling of plastics including packaging/ containers, and reduce use of non bio-degradables	Numbers of promotions and amounts reused/ recycled	MNRE-PUMA, partners, NTT
		Conduct an awareness campaign to stop burning wastes to reduce unintentional POPs	Numbers of promotions and their effectiveness on stopping burning waste	MNRE-PUMA, NTT village communities
	Further assess and monitor the releases of dioxins and furans.	Undertake further assessment of releases of dioxins and furans.	Funding for programme is secured. Monitoring data is collected, analysed and reported publicly.	MNRE, MOH, NUS, NTT
		Develop and implement a program for the long term monitoring of dioxin and furan bioaccumulation in human tissues	Funding for program secured.	MNRE, MOH, NUS
		Monitor and research the impacts on reduction for meeting the proposed target with links to the above 3 actions.	Monitoring data is collected, analyzed and reported publicly.	MNRE, MOH, NUS, NTT

4.4.4 Strategy for the Elimination of Chemical Wastes and Stockpiles

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
<p>Reduce and eliminate releases from stockpiles and chemical wastes</p> <p><i>Reduce and eliminate releases from stockpiles and chemical wastes (Article 6)</i></p>	Develop and implement a programme for the disposal of stockpiles and the cleaning up of contaminated sites.	Identify potential disposal sites in Upolu and Savaii	Disposal sites are identified, and set aside.	MNRE-PUMA
		Develop selected sites to enable the safe disposal of hazardous chemical wastes.	Sites are designed and properly developed to deal with hazardous chemical wastes	MNRE-PUMA, MWTI, MOH, NTT
		Implement clean-up and management plans for identified contaminated sites	All priority hotspots are cleaned up.	MNRE-PUMA, NTT
		Facilitate and support the earliest implementation of the AusAID/SPREP POPs/PTS disposal project that will remove existing stockpiles of POPs and PTS for destruction in Australia.	Container shipment for disposal completed. Continued negotiation with AusAID/ SPREP for further phases for disposal of buried chemicals, contaminated sites, and/ or laboratory chemicals	MFAT, MNRE, EPC, ASC, NTT
		Enforce Waigani/ Basel Conventions for transboundary movement of waste, and use Rotterdam Convention article requiring identifying transit of hazardous chemicals	Number of disposals, report to Rotterdam Convention Secretariat of Samoa's requirement for transit, any such hazardous chemicals transit	MFAT, MNRE, SPA, MWTI, NTT
	Initiate capacity building programmes for clean-up and management of contaminated sites	Train staff in the safe handling and disposal of hazardous chemicals.	Selected staff of PUMA and other agencies and organizations received training.	MNRE-PUMA, NTT
		Procure appropriate safety gear and essential equipment	Equipment and gear procured	MNRE-PUMA
		Promote public awareness of the disposal sites and of clean up activities requiring public knowledge, participation and support.	No. of public notices aired or issued; The extent of public participation on clean-up activities.	MNRE-PUMA, MWCSO, MOH
		Secure the contaminated sites to minimise releases pending their remediation.	Compliance with Cabinet directive to secure initial sites and others identified	MNRE-PUMA, NTT, owners (e.g. ASC, IPC, SFC, EPC, W. Arp)

4.4.4 Strategy for the Elimination of Chemical Wastes and Stockpiles (cont'd)

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
	Identify other POPs contaminated sites and media and implement appropriate remedial measures.	Develop and implement a long-term strategy for pre-1987 electrical transformers.	Testing of electrical transformers is on-going and carried out systematically. All in-used transformers tested.	EPC, MNRE-PUMA
		Conduct testing of suspected sites of possible contamination with POPs and PTS including dieldrin, DDT and others.	A testing and monitoring program is implemented. Testing is carried out for other suspected sites.	MNRE-PUMA, MOH, NUS
		Monitor the NIP to incorporate findings and actions needed to address results of research and testing strategies.	Report of reviews conducted.	MNRE, NTT
		Enforce a permit system to import chemicals, especially industrial (including development)	Reports of MAF and MNRE of numbers of permits issued, and latter's development of system.	MNRE-PUMA, MAF, MCIL, SAME, COC, NTT

4.4.5 Action Plan for Information Management and Research

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
Impacts of hazardous chemicals (including POPs and PTS) on the health of Samoa's population and its environment are better understood <i>Information exchange (Article 9) and Research, development and monitoring (Article 11)</i>	Develop a national clearinghouse facility for information management and sharing to monitor POPs and PTS' chemicals movements and status.	Support the development of compatible databases between agencies and relevant institutions.	Compatible databases are set up in MNRE, MAF, MOH, MFR (Customs), EPC, SWA, others	PUMA, MOH, MAF, MNRE, MOF, MFR(Customs), EPC, SWA, NUS, USP
		Facilitate the sharing of data and information between agencies and institutions electronically and through the NTT.	Number of incidences of successful collaboration between agencies increases over current levels.	MNRE (PUMA, DEC), MOH, MFR(Customs), MAF, EPC, and others
	Initiate a programme of continued monitoring of potential contaminated sites and stockpiles	Design and implement an on-going programme of environmental monitoring of POPs and PTS targeting suspected sites and media.	A monitoring programme is funded and is generating useful monitoring information	PUMA, MOH, NUS, EPC, MAF
		Conduct training for relevant personnel and agencies to be involved in the monitoring programme. (from former 3b below)	Adequate number of people trained and directly working in the research programme.	PUMA, MOH, NUS
		NGOs are to link internationally for concern about such local sites and stockpiles.	Number of NGOs linked to Greenpeace Fiji's Pacific POPs network and others	SUNGO, PUMA, NTT
	Initiate research to determine the full extent and possible impacts of the current POPs bioaccumulation in animal and human tissues.	Design and implement a long term study on bioaccumulation of POPs in animal and human tissues.	A research programme is funded with satisfactory progress made in implementation. Findings are documented and presented/ published	PUMA, MOH, NUS
		Conduct epidemiological studies for possible impacts of dioxins and furans on human health.	A research programme is funded with satisfactory progress made in implementation. Findings are documented and presented/ published	MNRE-PUMA, MOH, NUS
	Strengthen long term multi-sectoral collaboration on the management of chemicals	Support the National Task Team to coordinate the NIP Implementation phase.	Presence at NTT and other meetings, including specific reports, e.g. participants at meetings	MNRE-PUMA, MAF, MCIL, SAME, COC, SWA, NTT.
	Support institutions' research	Institutions are to be supported in conducting research on POPs/ PTS and other relevant chemicals and their impacts on human and environmental health	Numbers of reports produced.	MNRE-PUMA, NUS, USP, MOH, EPC, SWA, NTT

4.4.6 Action Plan for Public Awareness

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
Raise community and/ or public awareness and understanding of POPs and PTS. <i>Public awareness (Article 10)</i>	Public awareness of contaminated areas.	Implement awareness activities targeting communities about contaminated areas [as a matter of priority]. These include workshops, seminars, media and signboards.	Meetings/workshops are held with all communities around affected areas.	PUMA, MWCSO, local NGOs, PUMA, MOH, NTT
	Public awareness of the environmental and human health impacts of POPs and PTS	Engage schools, villages and church groups (including women and youth groups) to raise awareness of POPs and PTS and their environmental and health impacts.	Number of planned workshops successfully held in several villages in Upolu and Savaii targeting different groups. Adequate media coverage at national level.	PUMA, MWCSO, NGOs, MESC MWCSO, village mayors, women, youth, farmers
		Develop awareness raising information materials (leaflets, T-shirts, posters) in both the Samoan and English languages and distribute them widely to schools and local communities.	Awareness raising materials developed and distributed widely.	MNRE-PUMA
		Encourage other initiatives such as competitions	Competitions are held successfully.	MNRE-PUMA
	Public awareness of legal mechanisms and institutional arrangements for the NIP.	Promote public awareness of legal mechanisms and processes for obtaining permits to import pesticides and other potentially hazardous chemicals, using TV, radio and newspaper media.	TV, radio and newspaper notices are released regularly.	MAF, MOH, MNRE
	Public awareness of the POPs NIP.	Promote awareness of and support for the NIP in all sectors of society	Wide public support.	MNRE-PUMA, MWCSO
	Promote and utilize local knowledge on non-POPs producing alternatives	Promote public awareness of such alternatives.	Wide public support	MNRE-PUMA, MWCSO

4.4.7 Action Plan for Capacity Building and Education

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
Improve Samoa's capacity to effectively implement all areas of its NIP <i>Capacity building and education (Article 10)</i>	Strengthen national capacity for border control	Improve capacity of border control agencies (Customs and Quarantine) to access and share up-to-date information on registered chemicals, importers, new technologies, and alternative chemicals.	Databases are developed and used widely to support border control work. Number of cases of non-compliance reported by Customs and Quarantine officers.	MFR (Customs), MAF, MOH, NGOs
		Strengthen the capacity of the Office of the Pesticides Registrar through the provision of training, computer equipment and additional staff.	Pesticides Registrar's office is equipped with computer and training provided.	MAF, PUMA-MNRE
		Illegal traffic of chemicals is to be minimised by efficient border control.	Reports of interceptions from businesses as well as at ports of entry.	MFR, PUMA, MAF, MCIL, MWCSO, NTT
	Strengthen national capacity for hazardous chemical management/ environmental monitoring capacity of relevant agencies and organizations.	Support the strengthening of environmental science education at the NUS including capacity of in-service teachers.	Project resources are shared with NUS to support its environmental science program.	PUMA, NUS, NTT
		Develop the capacity of appropriate local institutions (e.g. MOH) to perform chemical analyses and other technical scientific tests to support the POPs and PTS monitoring program.	Analyses and other scientific tests are carried out by local institutions.	PUMA, NTT, NUS, MOH, SWA, USP
		Provide specific training in chemical monitoring, field testing techniques for POPs and PTS chemicals.	Number of local scientists participating in further training to undertake POPs & PTS related research.	MNRE-PUMA, NTT, NUS, MOH, SWA
	Develop curricula from primary to tertiary levels	Curricula modules for POPs and hazardous chemicals are to be developed for all levels in the formal education system.	Number of curricula/ kits developed and level	MNRE-PUMA, MESC, NUS, USP, NTT
	Strengthen MNRE-PUMA's capacity to coordinate the implementation of NIP.	Develop CMU within PUMA for NIP and chemical related Conventions	CMU developed and active on NIP and chemical-related Conventions.	MNRE-PUMA, NUS, NTT
		Secure funding to enable the establishment of a CMU – the recruitment of key personnel and the procurement of needed equipment, supplies and other essential resources.	CMU is fully staffed and resourced. NIP implementation progressing steadily.	MNRE-PUMA, NTT

4.4.8 Action Plan for National Coordination and Consultation

Objectives	Actions	Activities	Performance Indicators	Implementing Agencies
NIP implementation is effectively coordinated with the full participation of all relevant agencies and organisations [National Coordination]	Strengthen multi-sectoral collaboration in support of the NIP implementation.	Establish the NTT for POPs as the official interagency mechanism to promote and support NIP implementation. Appoint additional members from key agencies not currently represented.	NTT meets regularly and actively involve in project review and monitoring. NTT membership includes all key agencies and organizations, private sector and NGO representatives.	MNRE-PUMA, NTT, MAF, MOH, MFR, MPPFS, SWA, SAME/ COC
		Establish a technical experts support team as a sub-committee of the NTT to advise the NTT on technical issues	Team established, number of meetings, and advice to NTT	MNRE-PUMA, NTT, NUS, USP
		Ensure that the NTT meets regularly and is active in monitoring and providing guidance for the effective implementation of the NIP.	Number of NTT meetings and guidance on implementation.	MNRE-PUMA, NTT
		ICT is to be used to strengthen collaboration.	Use of ICT reported to NTT	MNRE, NTT
	Ensure Samoa's effective participation in Convention-related conferences and meetings. [Participate actively in Conventions-related conferences and meetings.]	Coordinate effectively the active participation of appropriate representatives at regional and international meetings related to the Conventions	Number of official representatives attending. Number of meetings attended.	MNRE, NTT, MFAT
		Ensure the timely compilation and submission of national communications and reports	Number of meetings and submissions.	MNRE-PUMA, NTT
		Strengthen Samoa's involvement in the various working groups of the Convention	Number of working groups in which there is participation.	MNRE-PUMA, NTT

4.5 Indicative Financial Plan

A strategy for proposed sources of funding the NIP follows as also in 5 Priority Projects. Alternative sources proposed include Samoa Government funding as well as in-kind contributions, especially the GEF, and Bilateral donor partners. The latter include one already in progress through the AusAID/SPREP's POPs/PTS disposal project which has facilitated the disposal of stockpiles of POPs and intractable, obsolete pesticides. Further phase(s) may ensue to deal with buried pesticides and contaminated sites as well as obsolete laboratory chemicals.

4.5.1. Estimated Budget: Strategy for the Elimination of POPs & PTS

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$\$)	Proposed Source of Funding
To reduce and eliminate the import, use and release of intentional POPs and where appropriate PTS in Samoa <i>Reduce and eliminate the intentional production and release of POPs (Article.3)</i>	Legislative framework to ban POPs chemicals and regulate the importation of industrial chemicals	Review all chemical related legislation to address legal issues identified in the ICA Report.	15,000	0	0	0	0	\$15,000	GEF/ Bilateral
		Develop National Policy for the management of toxic chemicals and wastes in Samoa.	25,000	0	0	0	0	\$25,000	GEF
		Enact the MNRE Bill as a matter of priority.	0	0	0	0	0	0	GOS
		Provide an enabling environment to support the enforcement of existing legislation, in particular the Pesticides Regulation 1990.	5000	5000	5000	5000	5000	\$25,000	GOS

4.5.1. Estimated Budget: Strategy for the Elimination of POPs & PTS (cont'd)

	Strengthen capacity of institutions and agencies responsible for regulating chemical management.	Develop and implement protocols requiring the importers of chemicals to disclose the list of active ingredients of products and imported chemicals to facilitate the monitoring of POPs imported under different trade-names	15000	5000	5000	0	0	\$25000	GEF/Bilateral
		Train border control officers to effectively apply monitoring protocols regulating POPs importation	0	15000	15000	0	0	\$30000	GEF/Bilateral
		Regulate the import of properly labeled products in line with international trading standards and practices	0	0	10000	10000	0	\$20000	GEF/Bilateral

4.5.2 Estimated Budget: Strategy for the Registration of Exemption

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$)	Proposed Source of Funding
Register for DDT exemption for disease vector control <i>Register of specific exemptions (Article 4)</i>	Registration of Exemption for DDT by end of 2006	Prepare and transmit appropriate written notification and other reporting requirements to the Stockholm Convention Secretariat to request and register Samoa's exemption for DDT	20000	0	0	0	0	\$20,000	GEF/ Bilateral
		Prepare and submit a report to the Convention Secretariat and WHO after 3 years of exemption, as required under Annex B Part II of the Stockholm Convention	0	0	0	12000	0	\$12,000	GEF/ Bilateral
	Obtain information on alternative non-POPs to exemption	Seek from the Secretariat, WHO and others. alternatives, other than the 4 currently used, to exemption	0	0	0	0	0	0	GOS

4.5.3. Estimated Budget: Strategy for the Reduction of Releases of Unintentional POPs

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$\$)	Proposed Source of Funding
To reduce releases of unintentional POPs <i>Measures to reduce or eliminate releases from unintentional production (Article 5)</i>	Regulatory framework to promote the reduction of unintentional releases of dioxins and furans from incomplete combustion processes, such as internal combustion engines and power generation plants	Set emissions standards for motor vehicles and power generation plants.	0	20000	0	0	0	0	GEF/ Bilateral
		Enact national legislation to enforce emission standards for all vehicles and power generation.	0	2000	0	0	0	\$2000	GOS
		Conduct public awareness activities to promote emission standards amongst importers of motor vehicles and the general public.	0	10000	10000	0	0	\$20,000	GEF
		Develop local capacity (including institutions) to test all imported vehicles for compliance with new emission standards.	0	120000	50000	25000	25000	\$220,000	GEF/ Bilateral
		Monitor the impacts on reduction of releases for meeting the proposed target with links to the following actions (see below)	0	0	20,000	0	20,000	\$40,000	GEF/ Bilateral
		Technology to be sought with reduced releases of unintentional POPs, (e.g. fuel efficient stoves).	0	10,000	0	0	0	\$10,000	GEF/ Bilateral
	Improve air pollution control systems for all major incinerators and industries	Develop and implement a programme for upgrading and or replacing all existing public and private incinerators with cleaner technology or incinerators with effective APCS	0	50000	50000	50000	50000	\$200,000	GEF
		Industries are to be encouraged to improve APCS	0	2,000	2,000	2,000	2,000	\$8,000	GOS

4.5.3. Estimated Budget: Strategy for the Reduction of Releases of Unintentional POPs (cont'd)

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$\$)	Proposed Source of Funding
	Implement Actions of the Waste Management Strategy, which support separation of higher dioxin releasing chemicals	Initiate actions to promote the separation of waste materials, which generate unintentional POPs from open burning	0	0	15000	15000	15000	\$45,000	GEF/ Bilateral
		Promote composting as an alternative to burning organic materials, including waste	0	0	15,000	15,000	15,000	\$45,000	GEF/ Bilateral
		Promote efficient waste collection and disposal facilities to reduce burning wastes.	0	0	15,000	15,000	15,000	\$45,000	GEF/ Bilateral
		Promote reuse and recycling of plastics including packaging/ containers, and reduce use of non bio-degradables	0	0	15,000	15,000	15,000	\$45,000	GEF/ Bilateral
		Conduct an awareness campaign to stop burning wastes to reduce unintentional POPs	0	0	15,000	15,000	15,000	\$45,000	GEF/ Bilateral
	Further assess and monitor the releases of dioxin and furans	Undertake further assessment of releases of dioxins and furans	0	50,000	20,000	20,000	20000	\$110,000	GEF/ Bilateral
		Develop and implement a program for the long term monitoring of dioxin and furan bioaccumulation in human tissues	0	25,000	10,000	10,000	10,000	\$55,000	GEF/ Bilateral]
		Monitor and research the impacts on reduction for meeting the proposed target with links to the above actions	0	25,000	10,000	10,000	10,000	\$55,000	GEF/ Bilateral

4.5.4. Estimated Budget: Strategy for the Elimination of Chemical Wastes and Stockpiles

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$\$)	Proposed Source of Funding
Reduce and eliminate releases from stockpiles and chemical wastes <i>Measures to reduce or eliminate releases from stockpiles and wastes (Article 6)</i>	Develop and implement a programme for the disposal of stockpiles and the cleaning up of contaminated hotspots	Identify potential disposal sites for Upolu and Savaii	15000	15000	0	0	0	\$30,000	GEF/ Bilateral
		Develop selected sites to enable the safe disposal of hazardous chemical wastes	0	100000	100000	0	0	\$200,000	GEF/ Bilateral
		Implement clean-up and management plans for identified contaminated sites	0	50000	50000	50000	50000	\$200,000	GEF/ Bilateral
		Facilitate and support the earliest implementation of the AusAID/SPREP's POPs/ PTS disposal project that will remove existing stockpiles of POPs and PTS for destruction in Australia	10,000	0	0	0	0	\$10,000	AusAID/ SPREP
		Enforce Waigani/ Basel Conventions for transboundary movement of waste, and use Rotterdam Convention article requiring identifying transit of hazardous chemicals under Prior Informed Consent	10,000	0	0	0	0	\$10,000	GEF/ Bilateral
	Initiate capacity building programmes for clean-up and management of contaminated sites	Train staff in the safe handling and disposal of hazardous chemicals	0	20000	0	0	0	\$20,000	GEF/ Bilateral
		Procure essential equipment and safety gear for personnel	0	5000	0	5000	0	\$10,000	GEF/ Bilateral
		Promote public awareness of the disposal sites and of clean-up activities requiring public knowledge, participation and support	0	5000	5000	0	0	\$10,000	GEF/ Bilateral
		Secure the contaminated sites to minimize releases pending remediation	10,000	0	0	0	0	\$10,000	AusAID/ SPREP

4.5.4. Estimated Budget: Strategy for the Elimination of Chemical Wastes and Stockpiles (cont'd)

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$)	Proposed Source of Funding
	Identify other POPs contaminated sites and environmental media and implement appropriate remedial actions	Develop and implement a long term testing strategy for pre-1987 electrical transformers	5000	5000	5000	5000	5000	\$25,000	GEF/Bilateral
		Conduct testing of suspected sites for possible contamination with POPs and PTS including dieldrin, DDT and others	0	5000	5000	5000	5000	\$20,000	GEF/ Bilateral
		Review NIP to incorporate findings and actions needed to address results of research and testing strategies	0	0	0	0	0	0	GOS
		Enforce a permit system to import chemicals, especially industrial (including development)	10,000	0	0	0	0	\$10,000	GEF/ Bilateral

4.5.5. Estimated Budget: Action Plan for Information Management and Research

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$\$)	Proposed Source of Funding
Impacts of hazardous chemicals (including POPs and PTS) on the health of Samoa's population and its environment are better understood. <i>Information exchange (SC Article 9), and Research (Article 11)</i>	Develop a national clearinghouse facility for information management and sharing to monitor POPs and PTS' movements and status.	Support the development of compatible databases between agencies and relevant institutions	0	0	60000	0	0	\$60,000	GEF/ Bilateral
		Facilitate the sharing of data and information between agencies and institutions electronically and through the NTT	0	0	2000	0	0	\$2,000	GOS
	Initiate program of continued monitoring of potential contaminated sites and stockpiles.	Design and implement an on-going program of environmental monitoring of POPs and PTS targeting suspected sites and media	0	60000	50000	40000	40000	\$190,000	GEF/ Bilateral
		Conduct training for relevant personnel and agencies to be involved in the monitoring programmed	0	15,000	15,000	0	0	\$30,000	GEF/ Bilateral
		NGOs are to link internationally for concern about such sites and stockpiles	0	0	0	0	0	0	NGOs
	Initiate researches to determine the full extent and possible impacts of the current POPs bioaccumulation in animal and human tissues	Design and implement a long term study on bioaccumulation of POPs in animal and human tissues	0	25000	25000	25000	25000	\$100,000	GEF/ Bilateral
		Conduct epidemiological studies to investigate the impacts of dioxins and furans on human health	0	25000	25000	25000	25000	\$100,000	GEF/ Bilateral
	Strengthen long term multi-sectoral collaboration on the management of chemicals	Support the NTT to coordinate the NIP Implementation phase	10000	10000	10000	10000	10000	\$50,000	GEF/ Bilateral
	Support institutional research	Institutions are to be supported in conducting research on POPs/ PTS and other relevant chemicals for human and environmental health	50,000	50,000	50,000	50,000	50,000	\$250,000	GEF/ Bilateral

4.5.6 Estimated Budget: Action Plan for Public Awareness

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$)	Proposed Source of Funding	
<p>Raise community and/or public awareness and understanding of POPs and PTS.</p> <p><i>Public information, awareness (Article 10)</i></p>	Public awareness of contaminated areas	Implement public and community awareness activities about contaminated sites. These include workshops, seminars, media, and signboards.	10000	10000	10000	10000	10000	\$50,000	GEF/ Bilateral	
		Use all forms of media to raise public awareness of the environmental impact of burning biomass.	0	10000	0	0	0	\$10,000	GEF/ Bilateral	
		Encourage other initiatives such as competitions.	0	10,000	0	0	0	\$10,000	GEF/ Bilateral	
	Public awareness of the environmental and human health impacts of POPs and PTS	Engage schools, villages and church groups (including women and youth groups) to raise awareness of POPs and PTS and their environmental and health impacts.	30000	25000	10000	10000	10000	\$85,000	GEF/ Bilateral	
		Develop awareness raising information material (leaflets, T-shirts, posters) in both the Samoan and English languages and distribute them widely to schools and local communities.	12000	12000	10000	10000	10000	\$54,000	GEF/ Bilateral	
		Encourage other initiatives such as competitions	2,000	2,000	2,000	2,000	2,000	\$10,000	GEF/ Bilateral	
		Public awareness of legal mechanisms and institutional arrangements for the NIP	Promote awareness of legal mechanisms and processes for obtaining permits to import pesticides and other potentially hazardous chemicals, using TV, radio and newspaper media.	2000	2000	2000	2000	2000	\$10,000	GOS
		Public awareness of the NIP	Promote awareness of and support for the NIP in all sectors of society	4000	4000	4000	4000	4000	\$20,000	GOS
		Promote and utilizes local knowledge on non-pops producing alternatives	Promote public awareness of such alternatives	2,000	0	0	0	0	\$2,000	GOS

4.5.7 Estimated Budget: Action Plan for Capacity Building and Education

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$)	Proposed Source of Funding
Improve Samoa's capacity to effectively implement all areas of its NIP (Article 10)	Strengthen local capacity for border control	Improve capacity of border control agencies (Customs and Quarantine) to access and share up-to-date information on registered chemicals, importers, new technologies, alternative chemicals.	0	0	0	0	0	\$0	GOS
		Strengthen the capacity of the Office of the Pesticides Registrar through the provision of training, computer equipment and additional staff	0	25000	25000	0	0	\$50,000	GEF/ Bilateral
		Illegal traffic is to be minimized by efficient border control.	20,000	0	0	0	0	\$20,000	GEF/ Bilateral
	Strengthen the national capacity for hazardous chemical management /environmental monitoring capacity of relevant agencies and organizations	Support the strengthening of environmental science education at the NUS including capacity of in-service teachers	0	25000	25000	25000	25000	\$100,000	GEF/ Bilateral
		Develop the capacity of appropriate local institutions (e.g. MOH) to perform chemical analyses and other technical scientific tests to support the POPs and PTS monitoring programme	0	50000	50000	50000	50000	\$200,000	GEF/ Bilateral
		Provide specific training in chemical monitoring and in field-testing techniques for POPs and PTS chemicals	0	0	25000	0	0	\$25,000	GEF/ Bilateral
	Develop curricula from primary to tertiary levels	Curricula modules for POPs and hazardous chemicals are to be developed for all levels in the formal education system	4,000	2,000	2,000	2,000	4,000	\$14,000	GEF/ Bilateral
	Strengthen PUMA's capacity to coordinate the implementation of NIP	Develop CMU within PUMA for NIP and chemical-related Conventions	150,000	100,000	100,000	100,000	100,000	\$550,000	GEF/ Bilateral
		Secure funding to enable the establishment of a CMU – the recruitment of key personnel and the procurement of needed equipment, supplies and other essential resources	150000	100000	100000	100000	100000	\$550,000	GEF/ Bilateral

4.5.8 Estimated Budget: Action Plan for National Coordination and Consultation

Objectives	Action Plans	Activities	Y 1	Y 2	Y 3	Y 4	Y 5	Total (\$\$)	Proposed Source of Funding
NIP implementation is effectively coordinated with the full participation of all relevant agencies and organizations [National Coordination, and Participation at the chemical-related Convention meetings]	Strengthen multi-sectoral collaboration in support of the NIP implementation	Establish the NTT for POPs as the official interagency mechanism to promote and support NIP implementation. Appoint additional members from key agencies not currently represented	10000 - 20000	20000	20000	20000	20000	\$100000	GOS
		Establish a technical expert support team as a sub-committee of the NTT to advise the NTT on technical issues.	0	2000	2000	2000	2000	\$8000	GOS
		Ensure that the NTT meets regularly and is active in monitoring and providing guidance for the effective implementation of the NIP	0	0	0	0	0	0	GOS
		Information Communication Technology is to be used to strengthen collaboration	30000	5,000	5000	5000	30000	\$75000	GEF/ Bilateral
	Ensure Samoa's effective participation in Conventions-related conferences and meetings	Coordinate effectively the active participation of appropriate representatives at international meetings related to the Conventions	25000	25000	25000	25000	25000	\$125,000	GEF
		Ensure the timely compilation and submission of national communications and reports	0	15000	0	0	0	\$15,000	GEF
		Strengthen Samoa's involvement in the various working groups of the Convention	0	0	0	0	0	\$0	GOS

5. PRIORITY PROJECTS

In developing the NIP, some priority actions needing immediate attention over the next couple of years were highlighted to initiate the implementation. These priority actions were identified from the NIP workshop and through consultations with the NTT. The priority actions along with potential funding agencies and opportunities are being identified for the NTT and relevant Ministries and organizations to assist with the development of projects. Local budgets continue to be a very tight source of funds pending identification under Government's Sustainable Development Strategy.

It should be further noted that, although the priority actions below have been identified for immediate attention, other circumstances such as availability of funding for other actions could result in their implementation before the ones below. Due to uncertain availability of funds from the GEF National Capacity Self Assessment that opportunity has been deleted from three of the following. Likewise, the completion of the POPs enabling activity has required re-identification as NIP enabling activity opportunities.

Objectives	Priorities	Funding Opportunity
Eliminate the intentional release of POPs	Develop and implement national policy on chemical management including POPs	MNRE budget
	Control the importation of chemicals including products with POPs content	GEF-NIP implementation
Reduce the unintentional production of POPs	Strengthen national regulatory framework to reduce the release of dioxin and furans	GEF-NIP implementation
	Reduce the burning of firewood for cooking	GEF-NIP implementation
	Strengthen vehicle testing to ensure improved engine performance	Private sector investment
	Install proper air pollution control systems for all major incinerators and industries	Private sector investment
	Assess and monitor the levels of dioxin and furans production	GEF-NIP implementation
Reduce and/or eliminate releases from surplus stockpiles and chemical wastes	Build capacity to clean-up and manage stockpiles and contaminated sites	GEF-NIP implementation; Bilateral aid
	Clean-up surplus stockpiles and contaminated sites	GEF-NIP implementation Bilateral aid
Information management and research	Develop database to support the sustainable management of chemicals	GEF-NIP implementation
	Assess the impacts of POPs bio-accumulation in local animal tissue and humans	GEF-NIP implementation
National coordination	Strengthen the functions and roles of the MNRE and NTT for the sustainable management of POPs/PTS	MNRE budget
Public awareness	Conduct public awareness programmes on the sustainable management of POPs/NIP	MNRE budget

6. BIBLIOGRAPHY

Aalbersberg, B. n.d. Recent Chemical Analysis of Foods at the Institute of Applied Sciences University of the South Pacific.

Aalbersberg, B. and Thaman, B. 2001. POPs in Pacific Island Countries. Proceedings: Sub-Regional Awareness Raising Workshop on the PIC Procedure, POPs and the Basel and Waigani Conventions, 2-6 April 2001, Cairns, Australia.

Amano, S. 2002. Preliminary assessment of site investigation at Tafaigata landfill. SPREP, Apia.

Agency for Toxic Substances and Diseases Registry. 1997. Toxicological Profile for Polychlorinated biphenyls.

Agency for Toxic Substances and Diseases Registry. 2000. WHO Publication. Concise International Chemical Assessment Document 55.

Australian and New Zealand Guidelines for Fresh and Marine Water Quality. 2000. National Water Quality Management Strategy. Australian and New Zealand Environment and conservation Council and Agricultural and Resource Management Council of Australia and New Zealand.

Basel and Waigani Conventions – Interlinkages amongst Chemicals and Hazardous Waste-related Conventions

Cable, W. 2001. Preliminary Dioxin...Inventory of Samoa. In UNEP Chemicals Proceedings: Sub-Regional Awareness Raising Workshop on the Prior Informed Consent Procedure, Persistent Organic Pollutants and the Basel and Waigani Conventions, 2-6 April, 2001, Cairns, Australia.

Cable, W. 2002. PTS in Samoa: Sources and Concentrations, Issues and Related Activities. Paper presented at the GEF Regionally-Based Assessment of PTS - Region IX Technical Workshop, Apia, Samoa.

Canadian Environmental Quality Guidelines 1999 Canadian Council of Ministers of the Environment. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (updated 2002). <http://www.ccme.ca>

Department of Agriculture 1956. *Laufasi Ola* Vol.1

FAO & UNEP. 2000. PIC Circular XII. December 2000:29.

FAO and UNEP. 1999. PIC: Synopsis of Notifications of Control Actions Received Before 11 September 1998 Under the Original Procedure. PIC Circular December 1999.

Fryauff, D.J. 1982. Pesticide use and regulation in Western Samoa: A report outlining current pesticide usage and expenditure, a review of government regulations with recommendations for change and improvement, and the occurrence of insecticide residues in Western Samoa. Samoan-German Crop Protection Project.

Global Programme of Action GPA for the protection of the Marine Environment from Land-based Activities. 2003. Persistent Organic Pollutants in the Marine Environment. GPA Clearing-House Mechanism (<http://pops.gpa.unep.org>).

Government of Samoa. 2002. Samoa Enabling Activity: An Initial Assistance to Samoa to Meet Its Obligations under the Stockholm convention. for POPs. <http://www.undp.org.ws/ecfprojectsamoa.htm>

GOS, MNRE). 2002. Potential Persistent Toxic Substances in Samoa: Sources and Concentrations, Issues and Related Activities.

GOS, Ministry of Natural Resources and Environment. 2003. Preparation of an Initial Inventory of Persistent Organic Pollutants and Persistent Toxic Substances (PTS) Presence, Levels and Trends in the Samoan Environment. Montgomery Watson Harza (MWH; New Zealand) Ltd., Christchurch, New Zealand.

GOS, MNRE. 2004a. Assessment for POPs and PTS in Samoa

GOS, MNRE. 2004a. Inventory of POPs and PTS in Samoa

GOS, MNRE. 2004c. POPs and PTS Institutional and Capacity Assessment for Samoa

Government of Western Samoa, Public Work Department and Kreditanstalt für Wiederaufbau (KfW). 1993. *Apia Sewerage Project Water Quality and Biological Studies*. GWK Consult Water Supply, Waste Disposal, Sanitation Consulting Engineers, Mannheim, F.R. Germany in association with G.M. Meredith & Associates Ltd., Engineers, Architects and Planners, Apia, W. Samoa.

Malua, T.L., B. Cable and P. Heveldt. 2004. Persistent Organic Pollutants and Persistent Toxic Substances pages 27-34 in Samoa's Environment. Environment Forum 2003. <http://www.mnre.gov.ws/documents/forum/2004.pdf>

Malua, T.L. and B. Cable. In press. Samoa's National Implementation Plan for POPs: Reaching Consensus. Samoa's Environment Forum 2004, NUS, Lepapaigalagala.

Ministry for the Environment (NZ). 1999. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand. <http://www.mfe.govt.nz>

Ministry for the Environment (NZ). 1997. Health and Environmental Guidelines for Selected Timber Treatment Chemicals. <http://www.mfe.govt.nz>

National Environmental Protection Measure. 1999. Assessment of Site Contamination. <http://www.ephc.gov.au/nepms>.

New South Wales Environment Protection Authority. 1995. Contaminated Sites Sampling Design Guidelines.

New Zealand Food Safety Authority. 2002. Food Standards Australia New Zealand. <http://www.foodstandards.govt.nz>

National Toxics Campaign Fund. 1993. Laboratory Test Results. Personal communication to the Director, O Le Siosiomaga Society, Apia.

Planning and Urban Management Agency (PUMA), MNRE. 2003 (internal report). POPs Enabling Activity –D2 Prepare initial inventory of POPs imports...; D3 – Prepare initial inventory of obsolete POPs PUMA, Apia.

Ritter, L. et al., 1995, IPCS Assessment Report *Persistent Organic Pollutants: An Assessment Report on DDT, Aldrin, Dieldrin, Endrin, Chlordane, Heptachlor,*

Hexachlorobenzene, Mirex, Toxaphene, Polychlorinated Biphenyls, Dioxins, and Furans, International Programme on Chemical Safety.

Samoa Drinking-water Standards. 1999. Samoa Drinking-water Standards Working Group (Final Draft)

SPREP. 2000. *Management of Persistent Organic Pollutants in Pacific Island Countries*.

SPREP. 2003. Samoa POPs Project Country Plan

SPREP. 2003. *SPREP Waigani Handbook* - provides interlinkages among Chemicals and Hazardous Waste related Conventions (Stockholm, Rotterdam, Basel and Waigani Convention). Available in CD-ROM and hard copy.

Taule'alo, T.I. 1993. Western Samoa: state of the environment report. Apia, Western Samoa: SPREP.

United Nations Environment Programme (UNEP) Chemicals. 2000. *GEF: Regionally Based Assessment of PTS*. Geneva, Switzerland.

UNEP Chemicals. 2000. *Survey of Currently Available Non-incineration PCB Destruction Technologies*. UN/UNEP.

UNEP Chemicals. 2001. Proceedings – Sub-regional awareness raising workshop on Prior Informed Consent Procedure, Persistent Organic Pollutants and the Basel and Waigani Convention. 2-6 April 2001, Cairns Australia. UNEP

UNEP Chemicals 2002. *Pacific Islands Regional Report: Regionally Based Assessment of Persistent Toxic Substances*.

UNEP Chemicals 2003a. *GEF Global Report: Regionally Based Assessment of Persistent Toxic Substances*

UNEP Chemicals. 2003b. *Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases*. UNEP Chemicals, Geneva.

UNEP and SPREP. 2000. Regional Plan of Action for Land-Based Pollution.

UNEP/World Bank. 2004?. *Guidance for developing a National Implementation Plan for the Stockholm Convention* (Draft Only).

United States Food and Drug Administration. 1993. Centre for Food Safety and Applied Nutrition. Guidance Documents for Trace Elements in Seafood. <http://www.cfsan.fda.gov/~frf/guid-sf.html>

United States Environmental Protection Agency Region 6. 2000. Human Health Medium-Specific Screening Levels. <http://www.epa.gov/region06>

van Es, H. M. (1990). Pesticide Management for Water Quality Principles and Practices. Cornell University. <http://pmep.cce.cornell.edu/facts-slides-self/facts/pestmgt-water-qual-90.html>

Van Ieeuwen FXR, Yonnes M. WHO revises the Tolerable Daily Intake for Dioxins. Organohalogen Compounds 1998. 38:295-298

Wallace, E. 1997. Manual of Agrichemical Identification and Emergency Management. Agro-Research Enterprises Limited, New Zealand.

Western Samoa Water Authority. 1996. National Water Resources Master Plan Study (Stage 1) Vol. 1 – Final Report. Rofe, Kennard & Lapworth in association with G.M. Meredith & Associates Ltd. Apia, Samoa and Sutton Surrey, England.

World Health Organization 1993. Environmental Health Criteria on PCB and Tephnyls. 2nd Edition.

WHO. 1997. Environmental Health Criteria 195. Geneva, Switzerland

WHO. 1999. Study of dietary intake of chemical contaminants.

World Health Organization 1998. WHO experts re-evaluate health risks from dioxins. Press release WHO/45

Websites

International Chemicals Organization www.inchem.org

German Food Standards Press release www.umweltbundesamt.de

Rotterdam Convention www.pops.int

UK Food Standards www.foodstandards.gov.uk

UNEP www.unep.org

UNFCCC <http://unfccc.int/>

SPREP <http://www.sprep.org.ws/>

MNRE <http://www.mnre.gov.ws/>

LIST OF PEOPLE CONSULTED

<u>Organisation</u>	<u>Name</u>
PECL	Muliagatele Iosefatu Reti Sam Sesega Cedric Schuster Faainuisemalie Latu Arona Palamo
UNDP	Easter Galuvao Veronika Levi Meapelo Maiiai
MNRE	Taulealeausumai Laavasa Malua Fetoloai Yandall-Alama Bill Cable Pauline Gabriel Tufuga Faafetai Sagapolutele Jude Kohlhase Filomena Nelson Pipi P. Leavai Sunny Seuseu Fotuitaua Y. Kerlake Eiko Fuimaono Theresa Potoi-Vaai Dhayani Yogesvaran
MAF	Pimalolo Maiava Asuao Kirifi Pouono Tofa Siitia Karryn Kwan Fata Alo Fania
ASC	Toomata Aki Tuipea Taele Leuta Saifoloi
British American Tobacco	Tagaloa Elisara Gale
EPC	Muaausa Joseph Walter Taulealeausumai A. Tiotio Folasaitu Crawley Sale Faletolu
Farm Supplies Ltd.	Loise Panoa Moala
ARCO Chemicals	Lolovai Leutele
SPREP	Dr Frank Griffin Clark Peteru
SPC	Dr Sada Nand Lal
USP	David Hunter Daya Pereira

MOH	Lafai Sinei Fili Manufeao Lameko Tesimale Paulo Pemita Seuseu
MFAT	Desna Solofa Samantha Marfleet
MOF	Lina Esera Paul Meredith
MFR(Customs)	Tuilaepa Ropati Kamu Nanai Malaeleua Sua Maui Alama Mose Faafetai Lautua
MWTI	Sione S Faitala Leo Bartley Tafai Toilolo
MESC	Taasoalii Saivaise Hofeni Ah Voa
MWCSD	Avaiseqa Sara Tauai Diana Roma
NUS	Dr. Jacinta Moreau
SPA	Fagaloa Tufuga Popese Motuga
Samoa Tourism Authority	Christina Leala
Scientific Pest Management	Paul Tomane
Faleula Farmers Association	Sevao Akeimo, Maugaalii Lafaele
Petroleum Products Supplies	Iopu Pua
SAME	Jeff Atoa
Others	Dr Bruce Graham Dr Paul F Heveldt Marty O'Cain

Consultation Workshops

Government Agencies (16 September 2004)	Anastacia Amoa, Saroni Rimoni – OAG Faolotoi Reupena - Audit Office Margaret Chan Cheuk - Central Bank of Samoa Leu Sootaga - Legislative Assembly Leuelu Seiui - Min. of Communication & Info. Technology Fata A Salale - MPPFS Filemoni L. - Min. of Prime Minister & Cabinet Penny Alama - Public Service Commission Mauala Seiuli - Ombudsman Office
--	--

Anesi Faalafi - Samoa Housing Authority
 Ioane Evalu - Samoa Land Corporation.
 Tutonu - Samoa Life Assurance Corporation
 Nonumalo Salesa - Samoa Polytechnic
 Tapuai Soti - Samoa Shipping Corporation
 Leuma, Margaret - SamoaTel

Samoa Umbrella for NGOs
 (20 August 2004)

Raymond Voigt; Faranisisi Ierome; Faiese Talataina;
 Pesila A. Asiata; Talooemaagao Olana; Vaasilifiti M
 Jackson; Mafi Oloapu; Leicester Dean; Eseta Mataituli;
 Vivian L. Suatele; Fepai Kolia; Tuolima Taala; Masunu T.
 Utumapu; Sauni Marie Fong; L. Faatino; Faamamalu Asiata;
 Foketi Silomiga; Tapusalala Faatonu; Olivia F. Latu;
 Rosalia Me

COC
 (6 September 2004)

Maria Melei (Vice President); Laeimau Oketevi Tanuvasa;
 Beverly Barlow; John Boyle; Patrick Chan Mow; Ned Brown;
 Fatu Tauafiafi; Adele Kruse; Arthur Penn; David Sami; Iuni
 Vaeau; Lian Taaloga; Klaus Stunzner; Matilda Meredith
 Tapusoa; John Ryan

Number of Participants

Village Mayors and Farmer
 Representatives of Savaii
 (13 October 2004)

140

Women and Youth
 representatives of Savaii
 (14 October 2004)

166

Village Mayors and Farmer
 Representatives of Upolu
 (20 October 2004)

130

Women and Youth
 representatives of Upolu
 (21 October 2004)

184