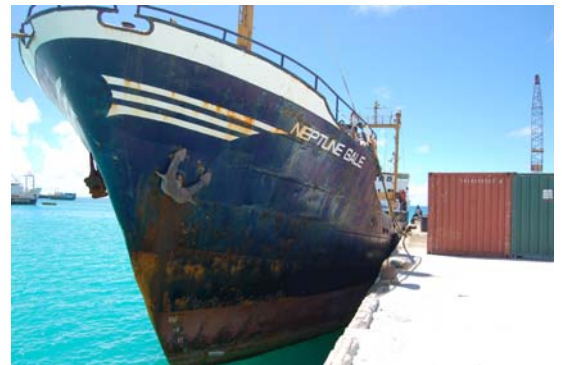


AUSTRALIAN AGENCY FOR  
INTERNATIONAL DEVELOPMENT

## PERSISTENT ORGANIC POLLUTANTS (POPs) IN PACIFIC ISLAND COUNTRIES PHASE II



### Project Completion Report

PM016

September 2010

GHD PTY LTD



In association with  
HATLAR ENVIRONMENTAL PTY LTD  
HK SHIPPING INTERNATIONAL PTY LIMITED  
BCD TECHNOLOGIES PTY LTD

**PERSISTENT ORGANIC POLLUTANTS (POPs) IN PACIFIC ISLAND COUNTRIES (PICs) PHASE II  
PROJECT<sup>1</sup>**

**SCHEDULED POPs AND INTRACTABLE PESTICIDES DISPOSAL**

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<sup>1</sup> Implementation of Components 2, 3 and 4 of POPs in PICs Project Phase II only.

## TABLE OF CONTENTS

<b>GENERAL INFORMATION</b>	<b>_____</b>	<b>III</b>
<b>CERTIFICATION</b>	<b>_____</b>	<b>IV</b>
<b>BASIC ACTIVITY DATA</b>	<b>_____</b>	<b>V</b>
<b>EXECUTIVE SUMMARY</b>	<b>_____</b>	<b>IX</b>
<b>1. BACKGROUND</b>	<b>_____</b>	<b>1</b>
1.1	REQUEST .....	1
1.2	PROGRAMME CONTEXT AND RATIONALE .....	1
1.2.1	Project Design Document.....	2
1.2.2	Alternatives Considered .....	2
1.2.3	Environment Protection and Biodiversity Conservation Act Referral .....	2
1.2.4	Memoranda of Understanding.....	3
<b>2. PROJECT DESCRIPTION</b>	<b>_____</b>	<b>3</b>
<b>3. EFFECTIVENESS</b>	<b>_____</b>	<b>5</b>
3.1	ACHIEVEMENTS OF THE PROJECT .....	5
3.2	QUALITATIVE ASSESSMENT.....	10
3.2.1	Risk Management .....	10
3.2.2	Procurement.....	12
3.2.3	Sourcing and Management of Technical Assistance.....	12
3.2.4	Monitoring by different parties and appropriate management decisions taken in response to emerging issues .....	13
3.2.5	Joint Management Committee supervision of the initiative, level of ownership, and capacity to provide bilateral support and guidance .....	13
3.2.6	Coordination with other activities by the partner government or other donors.....	14
3.2.7	Partner government fulfilment of responsibilities in the MoU including staffing and other resources, support from officials .....	14
<b>4. EFFICIENCY</b>	<b>_____</b>	<b>14</b>

4.1	COST-BENEFIT ANALYSIS.....	14
4.2	VALUE FOR MONEY .....	15
4.2.1	Contract Variations.....	15
<b>5.</b>	<b>IMPACT AND SUSTAINABILITY _____</b>	<b>16</b>
5.1	ACCELERATING ECONOMIC GROWTH AND REDUCING POVERTY .....	16
5.2	CROSS-SECTORIAL IMPACT .....	17
5.2.1	Gender Equality .....	17
5.2.2	Environmental Impacts.....	17
5.2.3	Cross-Cutting Governance Issues .....	18
5.2.4	Partnership and Promotion of Regional Stability and cooperation .....	18
5.3	LONG TERM CAPACITY DEVELOPMENT .....	18
<b>6.</b>	<b>RELEVANCE _____</b>	<b>19</b>
6.1	THE INITIATIVE OBJECTIVES.....	19
6.2	FORM OF AID.....	19
6.3	MANAGEMENT AND INSTITUTIONAL ARRANGEMENTS .....	19
<b>7.</b>	<b>LESSONS LEARNED _____</b>	<b>20</b>
<b>8.</b>	<b>OVERALL CONCLUSIONS _____</b>	<b>20</b>

## ANNEXES

Annex 1	PROJECT PERSONNEL AND STAKEHOLDERS
Annex 2	PROJECT CHRONOLOGY
Annex 3	PROJECT COMPLETION REPORT WORKING PAPERS
Annex 4	PROJECT MANAGEMENT REPORTS

## GENERAL INFORMATION

### Acronyms and Abbreviations

AMC	Australian Managing Contractor
AQIS	Australian Quarantine Inspection Service (a division of DAFF)
AusAID	Australian Agency for International Development
DAFF	Department of Agriculture, Fisheries and Forestry
DDT	Dichloro Diphenyl Trichloroethane
DEWHA	Department of the Environment, Water, Heritage and the Arts (formerly the Department of the Environment and Water Resources)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
FoA	Form of Aid
FSM	Federated States of Micronesia
GEF	Global Environment Facility
GEF PAS	Global Environment Facility - Pacific Alliance for Sustainability
GoA	Government of Australia
MoU	Memoranda of Understanding
NGO	Non Government Organisation
NIP	National Implementation Plan
OH&S	Occupational Health and Safety
PCBs	Polychlorinated biphenyls
PCC	Project Coordination Committee
PDD	Project Design Document
PICs	Pacific Island Countries
PM	Project Manager
PNG	Papua New Guinea
POPs	Persistent Organic Pollutants
ppm	parts per million
QEPA	Queensland Environmental Protection Agency
RMP	Risk Management Plan
SAICM	Strategic Approach to International Chemicals Management
SIDs	Small Island Development States
SPREP	Secretariat of the Pacific Regional Environment Programme (PROE – Programme Régional Océanien de l'Environnement)
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme

## Glossary

Basel Convention	The Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal, 1989, is a global treaty with an objective to minimise, with the aim of eliminating, the generation and transboundary movement of hazardous waste.
CabWater	CabWater is a division of the Caboolture Shire Council (now Moreton Bay Regional Council), responsible for managing trade waste from Narangba Industrial Estate, Queensland.
Dioxin and Furans	Dioxins and furans are common terms to denote polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). Dioxins and furans occur together as by-products from incineration at temperatures below 1200°C of chlorine containing products. They can also occur as by-products in the manufacture of organochlorides, in the bleaching of paper, and from natural sources such as volcanoes and forest fires. Both dioxins and furans are highly toxic and are scheduled under the Stockholm Convention.
DEWHA	Federal Australian government department responsible for environment and heritage management, including Australia's responsibilities under the Basel and Waigani Convention and administration and regulation of the EPBC Act.
Intractable pesticides	For the purposes of this Project, intractable pesticides are "pesticides that cannot be safely disposed of in the Pacific" (AusAID, 2002). Note, only stockpiled intractable pesticides that met the acceptance requirements of the nominated destruction facility (BCD) in Australia were included in the Project.
Persistent Organic Pollutants (POPs)	POPs are synthetic organic chemicals, which are toxic, persistent and bio-accumulative, with potential to cause adverse effects to human health and the environment. Exposure to POPs can lead to serious health effects including cancers, birth defects, dysfunctional immune and reproductive systems and greater susceptibility to disease.
Scheduled POPs	Scheduled POPs are the 12 POPs annexed in the Stockholm Convention. They include: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, toxaphene, HCBs, PCBs, dioxins and furans.
Stockholm Convention	The Stockholm Convention on POPs is an international legally binding agreement, which entered into force in May 2004. Its objective is to protect human health and the environment from POPs. 172 countries, including Australia, were party to the Convention as of August 2010.
Waigani Convention	The Waigani Convention to Ban the Importation into Forum Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movements and Management of Hazardous Wastes within the South Pacific Region, 1995, is an international legally binding agreement that aims to stop the import of hazardous and radioactive waste into the South Pacific region, minimise production within the region and ensure the environmentally sound management and disposal of already existing waste.

## CERTIFICATION

This Completion Report has been completed in accordance with relevant guidelines, in this case, AusGuideline 5.1, Preparing Completion Reports for AusAID – Interim Guidelines, as amended 2008.

## BASIC ACTIVITY DATA

### Activity Name

The activity name is the *Persistent Organic Pollutants (POPs) in Pacific Island Countries (PICs), Phase II – Scheduled POPs and Intractable Pesticide Disposal Project* (herein referred to as the Project).

The Project was supported by the *Persistent Organic Pollutants Project Phase II Communication Strategy Implementation* (herein referred to as the Communication Strategy).

### Activity Location

The Project was undertaken in the Pacific Region and included 13 Pacific Island Countries (PICs): Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau<sup>2</sup>, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu (see Figure 1).

With the exception of Papua New Guinea, these 13 PICs represent all the independent island states that are members to the Secretariat of the Pacific Regional Environment Programme (SPREP).

### Implementation Arrangements

The Project implementation was divided into four components:

- ▶ Component 1 – In-country identification and confirmation of POPs for removal, in-country facilitation and overall quality assurance;
- ▶ Component 2 – POPs reconnaissance, collection, packaging and shipping to disposal facility;
- ▶ Component 3 – POPs destruction; and
- ▶ Component 4 – Project and contract management.

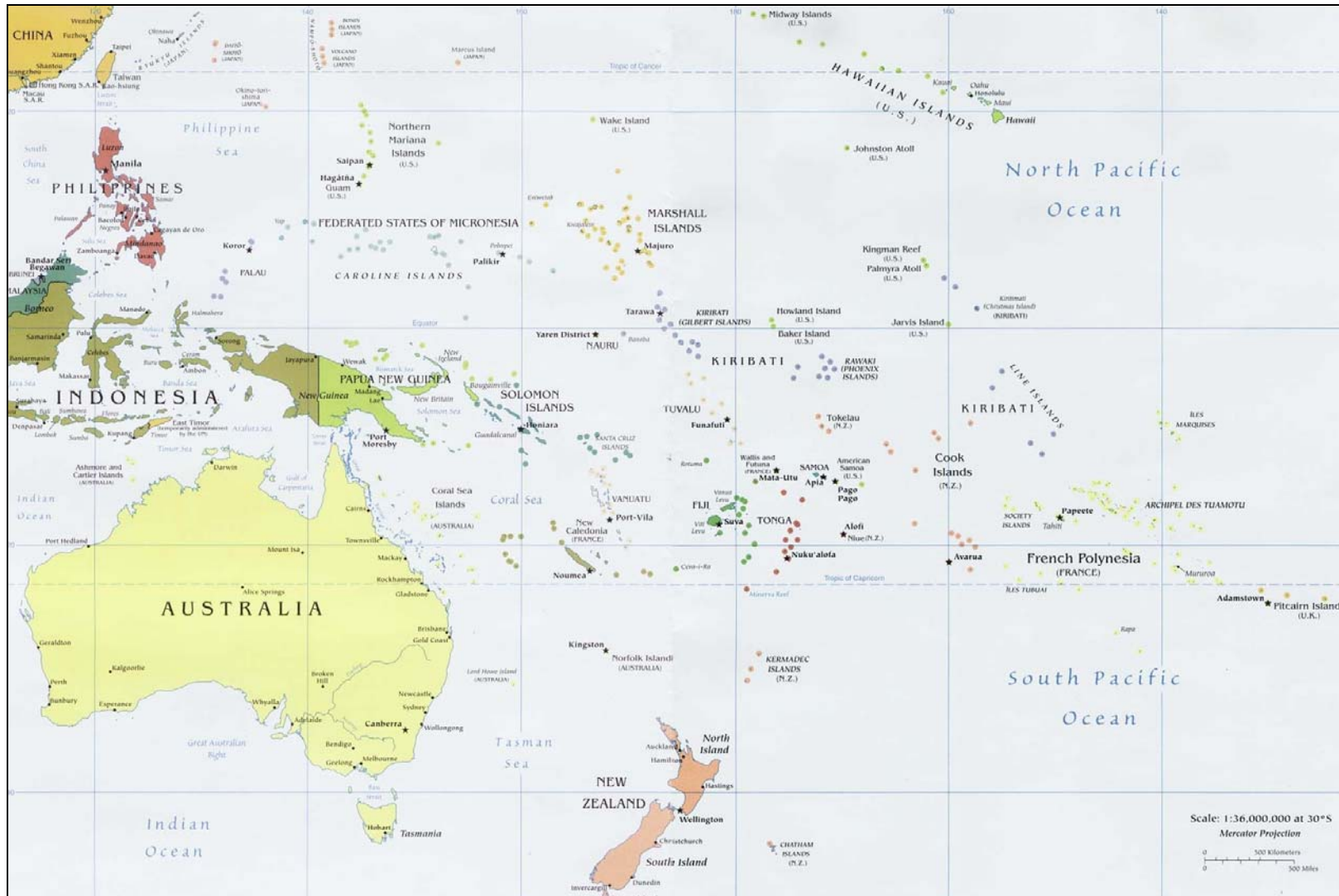
SPREP was responsible for implementation of Component 1. GHD Pty Ltd (GHD) as the Australian Managing Contractor (AMC) was responsible for the implementation of Components 2, 3 and 4. A list of roles, responsibilities and contacts for key AMC personnel is provided in Annex 1. GHD partnered with the Hatlar Group who provided POPs cleanup specialists; HK Logistics Pty Ltd who provided logistical support and BCD Technologies, operator of the POPs destruction facility.

A Joint Management Committee (JMC) comprising GHD and the aforementioned partner companies provided overall guidance throughout the Project delivery. A Project Coordinating Committee (PCC) included representatives from GHD, SPREP, AusAID, at least two PIC government agencies (rotating position between member PICs), and the Australian Department of Environment, Water, Heritage and Arts (DEWHA). See Section 3.2.5 for further information on the JMC and PCC.

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<sup>2</sup> At the time of the Project, Palau had not ratified Waigani or Basel conventions, and consequently was omitted from the Phase II scope due to barriers to international shipping approval for hazardous waste without the mechanisms of these Conventions. This report therefore refers to 12 PICs herein.

Figure 1 Map of Activity Area





## Key Dates

The Project was undertaken between April 2003 and June 2009 over a period of 75 months. The Project key activities are listed in Table 1. A detailed Project chronology is presented in Annex 2.

**Table 1 Key Project Activities**

Date	Activity
April 2003	Project awarded to GHD and contracts finalised
August 2003	Project Procedures Manual, including Emergency Response Plan, Risk Management Plan and Field Operating Procedures submitted to AusAID
August 2003	Team mobilised to Samoa, Fiji, Vanuatu and Cook Islands to complete reconnaissance visits
September 2003	Team mobilised to Marshall Islands, Palau, FSM to complete reconnaissance visits
October 2003	Team mobilised to Kiribati, Nauru, Niue, Tonga, Tuvalu and Fiji to complete reconnaissance visits
February 2004	First PCC meeting held in Port Vila, Vanuatu
June 2004 to March 2006	Cleanup and repackaging of POPs and intractable waste - refer to Annex 2 for specific cleanup and repackaging dates
December 2004 to February 2009	Transshipment of POPs from PICs to Australia and transport to BCD Destruction Facility - refer to Annex 2 for specific shipment dates
March 2005	Second PCC meeting held in Wellington, New Zealand
June 2005 to May 2009	Destruction of all POPs shipped to Australia under the Project – refer to Annex 2 for specific destruction dates
May 2008	Final PCC meeting held in Apia, Samoa

## Approved and Actual Cost of the Project

A summary of actual costs of the Project in Australian Dollars (AUD) is provided in Table 2, outlining expenditure by year and type. Project costs are discussed in Section 4.

**Table 2 Project Cost Summary, Annual Expenditure (AUD)**

GoA Expenditure Item	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	Total	% Total
Management and Milestones	60,317	632,994	376,560	782,961	272,656	73,330	373,367	2,572,185	39%
Shipping	-	92,162	683,382	776,232	92,457	22,720	47,106	1,714,059	26%
Special Insurances	-	-	123,300	-	29,228	23,971	-	176,499	3%
Cleanup costs, local transport and procurement	-	111,143	122,832	179,381	197,739	29,926	41,236	682,257	10%
Destruction costs	-	-	28,851	-	525,124	320,733	168,164	1,042,872	16%
PCC Meeting	-	20,151	10,770	-	6,619	-	34,791	72,331	1%
Communications	42,990	64,734	130,098	9,979	23,591	14,985	21,950	308,327	5%
<b>TOTAL</b>	<b>103,307</b>	<b>921,184</b>	<b>1,475,793</b>	<b>1,748,554</b>	<b>1,147,414</b>	<b>485,665</b>	<b>686,614</b>	<b>6,568,530</b>	

*Note: Some additional shipping, clean up and destruction costs were incurred as part of the Management and Milestone expenditure item.*

**Form of Aid**

The Project was delivered under the aid modality of project support. The assistance was aligned with regional priorities for the management of hazardous waste. It also complemented the international policy framework of the Stockholm Convention, which entered into force during the life of the Project.

The Project was delivered under a commercial contract by Australian Managing Contractor, GHD, in partnership with SPREP, a regional intergovernmental organisation. GHD had primary responsibility and accountability for managing the delivery of Australian Government resources.

The financing arrangement involved a monthly management fee paid to GHD, as well as milestone payments through the course of the Project. Funds were provided directly by AusAID to SPREP, for reimbursement of travel expenses. No financial commitment was required from or provided to participating PICs. MoUs were agreed between GoA and each PIC as part of the Project.

## EXECUTIVE SUMMARY

The Persistent Organic Pollutants in Pacific Island Countries (POPs in PICs), Phase II – Scheduled POPs and Intractable Pesticide Disposal Project was a seven-year project to reduce the threat posed by POPs and related chemicals toward the environment and human health in Pacific Island Countries. The Project was undertaken in the Pacific Region and included 12 PICs. The Project commenced in April 2003 and was completed in June 2009, at a total cost of AUD 6.57 Mil, funded by AusAID. The Project was delivered under the aid modality of 'project support', by Australian Managing Contractor, GHD, in partnership with the Secretariat of the Pacific Regional Environment Programme (SPREP).

The Project goal addressed country, regional and international priority issues, and is in alignment with the highest priority waste management issues in the Pacific as identified by SPREP member countries in the Waste Management Action Plan 1997-2000, and the objective of the Stockholm Convention. The mechanisms of the Basel or Waigani Convention were utilised for approvals to import the repackaged waste POPs into Australia for destruction.

A total of 124 tonnes of POPs and related chemicals were collected from 11 PICs, this included all reported POPs and related chemicals accessible to the team. All collected POPs were destroyed in an environmentally sound manner, providing a highly effective reduction of the threat of these toxic chemicals to human health and the environment.

The Project has been acknowledged for contributing towards PIC government capacity to manage hazardous chemicals, develop chemical manifests (required for completion of National Implementation Plans), and manage obligations and transshipment approvals under the Basel or Waigani Conventions, along with contributing towards raising the awareness in the community of the harmful effects of POPs and related chemicals, through conducting press conferences and media interviews with PIC environment staff. Secondary impacts included poverty reduction and economic growth through contributions to improved environmental quality and human health and promoting partnerships through the implementing provisions of Multilateral Environmental Agreements.

With a total Project cost of AUD 6.57 Mil and 124 tonnes of POPs destroyed, the approximate unit cost following final POPs destruction was AUD 53 per kilogram. Considering the challenges associated with the Project, this unit cost is considered cost-efficient, and includes management, collection, repackaging, approval, shipping and destruction of POPs from all participating PICs. Cost efficiencies were achieved through a regional approach to implementation, effective planning and communication, practical cleanup solutions, clearly defined scope and alignment with complementing programmes and initiatives. Areas for efficiency improvements include reducing the project duration and reducing container demurrage costs.

Lessons learned from the Project included: flexibility in the schedule was an integral component of the management of project risks; the initial reconnaissance was essential for cleanup planning (recognizing that relationships and increased awareness established during the reconnaissance contributed significantly to the success of the Project); the volume of stockpiled POPs and intractable waste increased over the duration of the Project as awareness of the collection activities was communicated via local media and through government channels; and effective communication with stakeholders provided significant project efficiencies.

The Project made a significant contribution to ridding the participating PICs of scheduled POPs and intractable pesticides, improving the environment through the reduction of the source of POPs contamination.

## 1. BACKGROUND

This Completion Report aims to review the Project preparation, delivery and achievements in regard to effectiveness, efficiency, impact and sustainability, relevance and lessons learned. This Report has been prepared by GHD with contribution from AusAID, SPREP and representatives from PIC governments who participated in the Project.

### 1.1 REQUEST

The Project was developed as an AusAID initiative aimed at improving chemicals management in the Pacific region, initiated in cooperation with SPREP in 1997 (SPREP, 2000). Recognising the increasing significance of waste management throughout the region, AusAID undertook a pre-feasibility study of potential waste management projects in the region identifying thirteen areas within which assistance was needed (AusAID, 1997). The management of waste chemicals was identified as the highest priority waste management issue. This priority was mirrored in SPREP's Action Plan 1997-2000 (SPREP, 1997) and in the Solid Waste Management Strategy (SPREP, 1996), as a priority issue for member PICs.

Based on this identified need, AusAID developed the POPs in PICs initiative, targeted at waste chemicals. Particular attention was given to POPs, which could not be managed effectively by the PICs, due to the absence of appropriate disposal or treatment facilities in the region.

The initiative was implemented in two phases. Phase I was implemented by SPREP between 1997 and 2000 and included development of an inventory of 'all hazardous or potentially hazardous chemicals'<sup>3</sup> in the thirteen PICs and a discussion of chemicals management options (Burns *et al*, 2000). Phase II (the subject of this report) was developed from the findings of Phase I, with a specific focus on scheduled POPs and intractable pesticides.

### 1.2 PROGRAMME CONTEXT AND RATIONALE

Historically, POPs were imported to the Pacific region as part of development assistance packages, to eradicate pests and increase agricultural productivity. DDT was used to eradicate vector-borne disease and to protect human health by preventing malaria. PCB-contaminated oils entered PICs through electrical transformers and capacitors, used to support light industries and power generation. Many imported POP pesticides, were never used, and the use of others was phased out, as the health and environmental impacts of these pesticides was understood. This led to significant stores of waste POPs and intractable pesticides throughout the Pacific, and in several cases burial or burning of pesticides stocks.

POPs are toxic organic compounds that resist biodegradation. As POPs are persistent and insoluble in water, but soluble in fatty tissue, they travel long distances and bioaccumulate in the food chain. They accumulate in the body fat of humans and animals and can be passed down to younger generations through breast-feeding and during pregnancy. POPs are endocrine disruptors and exposure to POPs can result in nervous system damage with impacts on learning and intelligence, liver damage and some cancers (Ritter *et al*, 1995).

All PICs in the Project are Small Island Developing States (SIDS), lacking the specialised resources (technology, power requirements, finance, etc.) needed for treatment and disposal of persistent and toxic chemicals. A further constraint is the low-lying and highly porous geology of many Pacific Islands atolls and as a consequence there is limited potential for establishment of safe underground waste

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<sup>3</sup> During Phase I the term POPs was interpreted broadly and considered more than those chemicals internationally defined as POPs. Consequently, the scope of Phase I included pesticides, PCBs, industrial chemicals, medical wastes, laboratory chemicals, oil, bitumen, timber treatment chemicals and fertilisers.

disposal facilities. Lack of awareness of the hazardous nature of some chemicals has exacerbated the problem of unsafe and unsecured storage. Further compounding these issues is that the SIDS rely heavily on traditional food sources and therefore on the quality of their environment for survival. Local industries such as fishing, agriculture, pearl industries and tourism depend on an unpolluted environment. In this context, the removal of POPs is important to the livelihoods and health of people in the Pacific Islands.

A particular strength of the PICs is that there is strong recognition of the importance of a healthy environment. The PICs customarily recognise the link between the health of their environment and the wellbeing of their communities. Therefore the PICs responded very positively towards the implementation of this Project.

Internationally and regionally, the Project is part of broad efforts to appropriately manage hazardous waste. Legally-binding international instruments such as the Stockholm, Waigani, Basel and Rotterdam Conventions have mobilised countries to adopt appropriate waste management measures. In 2004, the Stockholm Convention came into force. To meet their requirements under this Convention, PICs began developing National Implementation Plans (NIPs). Further, since 2006, PICs also began addressing chemicals more broadly through the adoption of the Strategic Approach to International Chemicals Management (SAICM). The Project was complementary to these activities. Regionally SPREP provides hazardous waste management assistance to its member countries through the Pacific Futures programme and specifically the Waste Management and Pollution Control focus area. SPREP worked in partnership with the AMC in the implementation of the Project. The Regional Solid Waste Action Plan is the strategy tool under which all waste (including hazardous) is prioritised and managed by SPREP.

### 1.2.1 Project Design Document

Development of the Project Design Document (PDD) was the primary Project preparation arrangement. It was developed by AusAID based on the findings and recommendations from Phase I and in consultation with SPREP, and consideration for alignment and harmonisation with other regional programmes. AusAID also consulted Australian stakeholders, as outlined in Section 2.

### 1.2.2 Alternatives Considered

AusAID considered several alternative options in the Project design process, including high-temperature incineration POPs destruction options. However incineration was rejected as a disposal method as POPs incineration can produce hazardous by-products, including dioxins and furans through incomplete combustion. Constructing a mobile BCD treatment system or facility within the Pacific was also considered. This was concluded to be unfeasible due to prohibitive capital cost, and unsafe in the absence of necessary reliable high-voltage power sources and infrastructure in the Pacific. AusAID concluded that BCD Technologies was the only facility in the Pacific region that could destroy POPs in an environmentally sound manner, using environmental best practice.

### 1.2.3 Environment Protection and Biodiversity Conservation Act Referral

The *Environment Protection and Biodiversity Conservation (EPBC) Act, 1999*, is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places; defined in the Act as matters of national environmental significance.

The Project was determined under the *EPBC Act* as a matter of national environmental significance<sup>4</sup>. This was the first time an AusAID Project had triggered the requirements of the Act. As part of the

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<sup>4</sup> Under Australian Commonwealth legislation, any AusAID project which AusAID or the Minister for Environment considers environmentally significant must meet the requirements of Subdivision A, Division 4, Part 11, Chapter 4 of the *EPBC Act*.

process for approvals the PDD was released for public comment on 30 November 2002. Twenty-two public submissions were received and addressed.

A Project Environmental Assessment (AusAID, 2003) was undertaken as part of the approvals process, assessing the potential for adverse environmental impacts. The report concluded:

*"While the project does potentially carry the risk of significant environmental damage in a worst case scenario, the risks are well understood and can be minimised through standard internationally recognised procedures, and emergency response plans can be developed to minimise impacts from any accidents. This low level of potential environmental risk needs to be balanced against the certain damage to the environment that is currently occurring through the way this material is presently stored."*

The report recommended that AusAID proceed to undertake the project as documented in the PDD with additional precautions listed in the report. These precautions were incorporated into the PDD.

#### 1.2.4 Memoranda of Understanding

Memoranda of Understanding (MoU) between the Government of Australia (GoA) and PIC governments were agreed during the initial stages of the Project. The MoU outlined the responsibilities and contributions of each Government under the Project, defined PIC executing authorities, and provided the legal basis of cooperation between the PICs and the GoA. Delays in the signing of some of the MoU resulted in revision and amendment to the cleanup and repackaging planning and coordination (GHD, 2005a).

## 2. PROJECT DESCRIPTION

The Project design centred on an outcomes-driven approach, with the outcomes being: collection, shipping and destruction of the stockpiled POPs and intractable pesticides identified in Phase I of the initiative, in order to improve the health and environment of the PIC communities. The overall goal of the Project was to:

*"reduce the threat posed by Persistent Organic Pollutants and related chemicals toward the environment and human health in PICs".*

The purpose of the Project was to:

*"dispose of Polychlorinated biphenyls (PCBs), and PCB-contaminated wash-liquid from transformers, small quantities of PCB-contaminated soil, stockpiled organochlorine pesticides including scheduled POPs and other intractable pesticides (mainly organochlorines and organophosphates), and small amounts of unidentified pesticides considered likely to fall into those categories in participating PICs".*

Key components of the Project included:

- **Stakeholder Consultation:** Importing hazardous waste from overseas was identified early in the Project preparation as a potentially contentious activity. A Communication Strategy was developed and implemented as part of the preparation and implementation arrangements. The Communication Strategy focused on early identification and resolution of concerns and potential issues, transparent and regular dissemination of information, attendance of Project personal at community meetings, and open dialogue with key stakeholders.

The Communication Strategy facilitated support for the Project from a broad range of stakeholders, some of whom were initially adverse to the Project. Several high profile environmental activists, including representatives of the International POPs Elimination Network (IPEN) became supporters of the Project and have continued to promote the Project in international forums. Endorsement was received from the Narangba Community Action Group, the Maritime Union of Australia (MUA), and from conservation non-governmental organisations (NGOs) with an interest in chemicals

management. At the request of Australian stakeholders, the nominated POPs destruction facility agreed to an independent emissions monitoring program during the destruction of Project wastes.

The positive and cooperative foundations laid with all stakeholders through the Communication Strategy were maintained throughout the Project and played a significant role in effective Project implementation.

- ▶ **Scope of POPs and Intractable Pesticides Collected:** The Project scope was clearly defined to include: 1) the 12 scheduled POPs defined under the Stockholm Convention: aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, PCBs, DDT, dioxins and furans; and 2) intractable pesticides defined by AusAID to include a wide family of chemicals used in pest, weed and insect control. All intractable pesticides were required to be compliant with BCD Technologies destruction operation licence specification. The scope did not include buried chemicals or residual contamination. The primary reason for focusing on these wastes was that other types of waste require different disposal methods, likely to involve incineration, in different locations, and approvals for an extended scope were likely to significantly delay the Project's implementation.
- ▶ **Compliance with governing laws and guidelines:** The need to understand and adhere to international, Australian (Federal), and State (Queensland) laws was fundamental to the Project. The Project maintained compliance with conventions, legislation, subordinate regulations, guidelines and codes across multiple jurisdictions.
- ▶ **Management of Risk:** The Project included features to minimise risk, including: 1) obtaining approvals in advance; 2) developing detailed procedures and specifications for cleanup, shipping, and destruction; and 3) maintaining transparency with all project stakeholders, and strong communication between the Project partners (discussed further in Section 3.2).
- ▶ **Reconnaissance:** Initial reconnaissance trips to each PIC were a critical aspect of the Project. During the reconnaissance trips the following tasks were undertaken: 1) POPs storage sites were inspected, contents and volumes of all chemicals confirmed and field testing or sampling was undertaken as required<sup>5</sup>; 2) logistical requirements such as shipping container and other equipment requirements and the adequacy of the port facilities were assessed to allow for successful clean up missions; 3) meetings were held with country officials to discuss requirements relating to the repackaging and shipment of wastes under the Waigani and/or Basel Conventions and related approvals processes; and 4) extensive discussions with relevant PIC authorities and NGOs relating to chemicals management and the hazardous waste transport approvals processes were undertaken.
- ▶ **Cleanup:** The approach to cleanup was based on 'low-tech' principles, appropriate in the Pacific context. Cleanup and repackaging of POPs was undertaken manually, by hazardous waste specialists in suitable personal protective equipment. Chemicals were repackaged into 205L United Nations certified drums with plastic liners. PCB-contaminated oils from electrical transformers were repackaged into certified drums, and the drained transformer casings were packaged for transportation. All drums and transformer casings were labelled for shipping and documented on a detailed manifest.
- ▶ **Additional Chemicals:** In some PICs, additional chemicals were identified (not previously identified in Phase I), as public awareness about POPs increased and additional stockpile sites were reported. An assessment of newly identified chemicals was completed to the extent practicable in each case and the additional POPs were included or excluded based on this assessment and AusAID's approval.

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<sup>5</sup> If the composition of chemicals was unclear, samples were collected and sent to Australia for analysis. It was not possible to move hazardous wastes under the Basel or Waigani Conventions unless the chemical composition was known.

- ▶ **Import Approval:** Once POPs were securely repackaged in each PIC, import permits were sought from DEWHA under the Waigani or Basel Convention process. Permits were also sought from Australia's Federal Department of Agriculture, Fisheries and Forestry (DAFF), the Australian Customs Service (ACS) and the Australian Quarantine Inspection Service (AQIS).
- ▶ **Shipping:** All repackaged POPs were shipped, generally via one or more transit ports due to the complex shipping routes in the Pacific, to the Port of Brisbane, Australia. Upon arrival in Brisbane the POPs containers were cleared by Australian Customs and inspected by AQIS<sup>6</sup> and QEPA. Once cleared, the containers were transported (with appropriate Waste Transport Certificate paperwork) to the BCD Technologies destruction facility. Shipping logistics were a major challenge on the Project, managed through maintaining flexible scheduling and frequent communication with project partners and other stakeholders.
- ▶ **Destruction:** All POPs shipped under the Project were destroyed at BCD Technologies. BCD Technologies utilises Base Catalysed Dechlorination and High Temperature Plasma Arc PLASCON<sup>®</sup> technologies to treat both pure PCB and oils contaminated with PCB. Patented, PLASCON<sup>®</sup>, high temperature plasma technology is used to destroy liquid and solid pesticides. Third party emissions monitoring was conducted on the air emissions and liquid discharge to independently review the destruction facility's compliance to licence and trade waste permit conditions.

### 3. EFFECTIVENESS

The effectiveness of the Project is considered against its overall goal of reducing the threat of POPs and related chemicals posed to the environment and human health in participating PICs and specifically against the indicators outlined in the PDD.

#### 3.1 ACHIEVEMENTS OF THE PROJECT

The achievements of the Project are assessed in Table 3 and tabulated against Logframe outputs and indicators defined in the PDD (original Project Logical Framework provided in Annex 3). Positive and negative deviations from the planned outputs are detailed in footnotes to the table. Several Project Reports are referred to in Table 3 and a list of all Project Reports is provided in Annex 4.

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<sup>6</sup> In some instances, containers were fumigated prior to being released from the Port of Brisbane, depending on the risk analysis conducted by AQIS and the Brisbane Port Authority.



Table 3 Project Achievements

DESCRIPTION	INDICATORS	ACHIEVEMENTS (Performance Against Indicators)
<b>COMPONENT 2: GOAL AND OBJECTIVE</b>		
To reduce the threat posed by Persistent Organic Pollutants (POPs) and related chemicals toward the environment and human health in PICs.		<p>The Project reduced the threat posed by POPs and related chemicals toward the environment and human health via:</p> <ul style="list-style-type: none"> <li>▶ Removal and destruction of 124 tonnes of POPs and related chemicals from PICs;</li> <li>▶ Contributing towards PIC government capacity to manage hazardous chemicals, develop chemical manifests (required for completion of NIPs), and manage obligations and transshipment approvals under the Basel or Waigani Conventions; and</li> <li>▶ Contributing towards raising the awareness in the community of the harmful effects of POPs and related chemicals, through conducting press conferences and media interviews with PIC environment staff.</li> </ul>
To dispose of Polychlorinated biphenyls (PCBs), and PCB-contaminated solvent from transformers, small quantities of PCB-contaminated soil, stockpiled organochlorinate pesticides including scheduled POPs and other intractable pesticides (mainly organochlorines and organophosphates), and unidentified pesticides considered likely to fall into those categories in participating PICs.	<p>PIC Monitoring Reports, audit report on destruction operation, and project Technical Report.</p> <p>Detailed description of government roles and extent of participation given in project technical report.</p>	<p>Project Cleanup Reports (see Annex 4) concluded that cleanup works successfully repackaged all POPs identified within the Country Cleanup Plans, with the exception of Nauru<sup>7</sup>.</p> <p>SPREP representative Dr Frank Griffin attended the following cleanups in a monitoring / auditor capacity: Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. Dr Griffin's reports were provided directly to AusAID and not to the AMC.</p> <p>The total of 124 tonnes of POPs and related chemicals destroyed included unidentified chemicals, which through laboratory analysis were deemed to be within the destruction acceptance criteria.</p> <p>Third-party emissions monitoring was conducted during destruction of waste at the facility (as detailed for Output 3.3).</p> <p>A detailed description of PIC government roles was agreed in MoU between GoA and each PIC.</p>
<b>COMPONENT 2: POPS COLLECTION, PACKAGING AND SHIPPING TO DISPOSAL FACILITY</b>		
<b>Output 2.1:</b> The AMC will have made contact with Environment Australia <sup>7</sup> to initiate the permitting processes required under the Basel and Waigani Conventions, and will have also facilitated the completion of country-to-country agreements that may be required for in-transit activities.	Checklist prepared by AMC of all required agreements. Letters of agreement or permit applications submitted by each PIC to Australia and other governments as required.	<p>In the initial phase of the Project the following were completed outlining a plan to ensure that permitting and other required agreements were in place prior to shipping:</p> <ul style="list-style-type: none"> <li>▶ Preparation and acceptance by AusAID of Project Reports defining required permitting and agreements for in-transit activities including: Project Procedures Manual (GHD, 2004b), Chemical Assessment Plan and Manifest (GHD, 2004c), Transport and Logistics Plan (GHD, 2004d);</li> <li>▶ Completion with DEWHA approval of the Permit Schedule Report (GHD, 2003b), outlining all international and national permitting requirements, including Basel and Waigani movement and notification form templates;</li> <li>▶ A Basel / Waigani Convention workshop was held in Fiji (May 2003) for PICs representative Competent Authorities to outline their obligations and provide instruction on how to complete the paperwork; and</li> </ul>

<sup>7</sup> DEWHA (formerly Environment Australia)

DESCRIPTION	INDICATORS	ACHIEVEMENTS (Performance Against Indicators)
		<ul style="list-style-type: none"> <li>AusAID facilitated agreement of 12 MoU between GoA and participating PICs governments.</li> </ul>
<b>Output 2.2:</b> Basel, Waigani or Special Permits obtained, with agreements within and between all participating PICs and Australia.	Permits issued by Australia, and other governments as required.	Basel or Waigani Notification and Movement Forms were completed and signed by all PICs. Special Import Permits were issued by DEWHA for all PICs, and all other relevant government agency approval was granted for all shipments. Note that the required permits were sought only once the POPs and related chemicals were repackaged.
<b>Output 2.3:</b> All PCBs, intractable pesticides and associated contaminated materials packaged by Clean-up contractor and prepared for shipping, within each PIC.	Audit reports for each PIC by SPREP to confirm operations completed.	<p>Country Cleanup Plans (GHD, 2004e) outlining POPs inventory, cleanup approach and schedule were prepared for each PIC based on the results of reconnaissance visits.</p> <p>Cleanup works were carried out in all PICs. Cleanup works successfully repackaged all POPs identified within the Country Cleanup Plans, with the exception of Nauru <sup>b</sup>.</p> <p>Additional POPs and related chemicals not previously identified in Phase I, were identified during the course of the Project. An assessment of newly identified chemicals was completed in each case and the additional POPs were included or excluded based on this assessment and AusAID's approval. Additional chemicals equated to an increase of approximately 10% on the total volume outlined in the Country Cleanup Plans.</p> <p>SPREP representative Dr Frank Griffin attended 12 cleanups in a monitoring / auditor capacity. Dr Griffin's reports were provided directly to AusAID and not to the AMC.</p>
<b>Output 2.4:</b> Shipping agreements finalised between the AMC and shipping company or companies.	Signed agreements.	<p>Shipping agreements were sought with commercial shipping lines where possible for cost efficiency. Charter shipping companies were required in Solomon Islands, FSM, and Kiribati.</p> <p>Shipping undertaken in each period was reported in the Project exception and annual reports. All shipping routes and other transport logistics are detailed in the Transport and Logistics Report (GHD, 2009a).</p>
<b>Output 2.5:</b> All POPs containers with PCBs, contaminated transformers, contaminated soils and other intractable pesticides collected from each PIC.	Containers removed.	All repackaged POPs and related chemicals were collected from the PICs. Container collection dates from each PIC are reported in the Transport and Logistics Report (GHD, 2009a). The first shipment of POPs exported under the Project occurred on 14 December 2004 from Samoa, and the last was exported on 5 August 2008 from Vanuatu.
<b>Output 2.6:</b> All POPs containers delivered to, and off-loaded at port of final destination.	Containers off-loaded at destination port.	All collected POPs were delivered and off-loaded at the port of final destination, including customs clearance and QEPA inspection and approval.
<b>COMPONENT 3: POPS DESTRUCTION</b>		
<b>Output 3.1:</b> AMC will have obtained any permits or approvals required at a State level for POPs import and disposal (NB: This output is a pre-requisite for the import permits covered under Output 2.2).	Permits obtained (or written confirmation that permits are not required).	<p>Permits were not required from QEPA for the importation of POPs. However, a representative from QEPA inspected each shipment upon arrival in Australia and provided written confirmation of the integrity of the cargo prior to transportation to the destruction facility.</p> <p>QEPA Waste Transport Certificates were completed for all overland transport of POPs from the Port of Brisbane to the destruction facility.</p>

DESCRIPTION	INDICATORS	ACHIEVEMENTS (Performance Against Indicators)
<b>Output 3.2:</b> All POPs containers transported to disposal facility or other agreed storage facility in receiving country.	Delivery and acceptance receipts	All collected POPs and related chemicals were delivered to BCD Technologies destruction facility. The delivery and acceptance receipts are contained in the POPs Disposal of Shipped Chemicals Report (GHD, 2009b).
<b>Output 3.3:</b> All POPs and associated contaminated materials successfully disposed.	Treatment processes carried out in accordance with agreed protocols.	<p>All POPs collected were destroyed. This included a total of 124 tonnes comprising:</p> <ul style="list-style-type: none"> <li>▶ 4 tonnes scheduled POPs (excluding PCBs);</li> <li>▶ 54 tonnes other intractable pesticides;</li> <li>▶ 49 tonnes PCB contaminated equipment;</li> <li>▶ 11 tonnes PCB contaminated oils; and</li> <li>▶ 5 tonnes PCB contaminated soils.</li> </ul> <p>Details of all POPs destroyed are presented in Annex 3.</p> <p>Third party monitoring was undertaken during the destruction process to monitor compliance with agreed protocols and trade waste permits. One breach of the facility's permit requirements was identified and corrective action was applied. Two subsequent third party monitoring events confirmed the facility was operating within its permit requirements.</p> <p>Destruction certificates were issued for all POPs destroyed which confirmed the final destruction all POPs and related chemicals. The achievements for this output are detailed clearly in the POPs Disposal of Shipped Chemicals Report (GHD, 2009b).</p>
<b>COMPONENT 4: PROJECT AND CONTRACT MANAGEMENT</b>		
<b>Output 4.1:</b> Effective project management will have operated throughout all of the Component 2 and 3 activities, including regular project reporting (six-monthly and exception reports and Annual Plan to AusAID), facilitation of PCC.	Effective and ongoing seamless project process.	<p>Effective project management was maintained throughout the duration of the Project, including regular reporting, updated annual plans and facilitation of PCC meetings. A list of all Project Reports is provided in Annex 4.</p> <p>The Project schedule was extended from 26 months (initial contract) to 75 months (final contract) due to several factors outside of AMC control <sup>d, e</sup>. These extensions were communicated and agreed with AusAID as the Project progressed.</p>
<b>Output 4.2:</b> Effective contract management, and liaison with stakeholders including participating governments, AusAID, Environment Australia.	Contract and other agreements in accordance with project work programme and timeframes.	<p>Regular six monthly reporting was completed over the course of the Project, in accordance with AusGuide and other quality standards. Reporting requirements were reduced with agreement from AusAID to annual reports in the final stages of the project.</p> <p>Exception reports were maintained over the course of the Project. A total of 21 exception reports were completed for the Project.</p> <p>Reporting to stakeholders was maintained via regular (3 monthly) stakeholder update letters and meetings.</p>
<b>Output 4.3:</b> Management of public and civil liability issues.	Responsibilities clearly spelt out in all	<p>A Risk Management Plan (GHD, 2003c) was developed and adhered to throughout project.</p> <p>Roles and responsibilities for each team member, key project stakeholder and PIC governments were clearly defined</p>

DESCRIPTION	INDICATORS	ACHIEVEMENTS (Performance Against Indicators)
	contract documents, along with documented evidence of adequate liability cover.	in the Project Procedures Manual (GHD, 2004b) and PIC-GoA MoU. Contracts in place with AMC team contractors further defined roles and responsibilities. Project specific insurances including Pollution Liability Insurance and Professional Indemnity Insurance were maintained throughout the project and extended at each project extension. Insurance certificates were required to be provided to DEWHA as part of the Waigani and Basel application to import processes.
<b>Output 4.4:</b> Project completion report prepared, including coordination of technical inputs from SPREP.	Project completion report.	The Completion Report was prepared by the AMC with contribution from AusAID, SPREP and representatives from PIC governments who participated in the Project. The Completion Report was finalised in accordance with AusGuideline 5.1, Preparing Completion Reports for AusAID – Interim Guidelines, as amended 2008.

Notes for Table 3:

- a. **Palau non-ratification of Conventions:** Due to Palau's failure to ratify the Basel or Waigani no agreements were made with Palau and POPs were not able to be shipped. The reconnaissance mission visited Palau and when the decision was taken not to ship chemicals from Palau, advice was provided on the safe storage of transformers.
- b. **Nauru PCBs:** The reconnaissance mission identified one transformer in Nauru containing PCB contaminated oil, which was to be included under the Project. On return to Nauru for the cleanup visit, the transformer had been removed from storage and was not able to be located. Anecdotal evidence identified that the transformer had been collected by scrap metal recyclers. A detailed report on the Nauru cleanup visit is detailed in the June 2005 Exception Report.
- c. **Trade waste breach by BCD:** Third party monitoring at BCD Technologies (BCD) trade waste breach for Polychlorinated Biphenyls (PCBs) in aqueous effluent from the facility on 25 May 2007. GHD initiated the following actions in response to the breach: 1) GHD notified the facility of the laboratory results. BCD agreed to notify QEPA and CabWater and to discontinue treatment of Project wastes until the breach was understood and rectified; 2) the monitoring results were verified. BCD confirmed that Airlabs Environmental had collected the monitoring samples from the correct point and that BCD had been in breach of its trade waste permit conditions; 4) BCD prepared a Trade Waste Breach Report (BCD, 2005); 5) GHD communicated the Trade Waste Breach report to stakeholders and prepared an Incident Report (GHD, 2007). The GHD Report included a procedure for preventing reoccurrence and for the destruction resuming operations; 6) QEPA undertook an assessment of the potential environmental impact of the breach. The review concluded that there were no detectable concentrations of PCBs in the receiving environment; and 8) BCD carried out operational corrections and, subsequent to approval by QEPA, CabWater, AusAID and GHD, destruction of Project POPs and related chemicals was resumed.
- d. **Project schedule extension:** The original work plan was 27 months. The following extensions were agreed with AusAID: 1) Project extended by 12 months due to complications finalising intergovernmental MoU; 2) Project extended by 18 months due to Vanuatu's delay in ratifying the Waigani Convention; 3) Project extended by further six months due to additional QEPA and AQIS requirements for importation and treatment of PCB contaminated soil from Vanuatu; 4) Project extended a further 12 months due to additional delays in transport and logistics for Vanuatu POPs and technical difficulties being experienced by BCD Technologies. The final duration of the Project was 75 months.
- e. **Additional POPs and intractable waste included in the Project:** In addition to POPs and intractable waste identified in Phase I and confirmed under the reconnaissance, significant volumes were identified during cleanup, and where possible, included in the Project: approximately one tonne of DDT and other intractable waste from Solomon Islands, approximately one tonne of pesticides from Kiribati and five tonnes of PCB contaminated soil from Vanuatu. Minor additional volumes were also collected from most PICs. However, the scope was strict in its definition of the type of waste that could be included and the destruction facility.

### 3.2 QUALITATIVE ASSESSMENT

This section provides a qualitative evaluation of Project management including management of risk, procurement, provision of technical assistance, monitoring, supervision, coordination and partner government fulfilment of responsibilities, and how management influenced the outcomes.

#### 3.2.1 Risk Management

Project risks, mitigation and management options were defined and communicated early in the Project planning stages. The overall Project risk management structure was divided broadly into:

- ▶ Management Risk requiring management actions to mitigate their potential impact to the Project, addressed in the Risk Management Plan (GHD, 2003c); and
- ▶ Operational Risk requiring specific field procedures and emergency response guidelines to manage and mitigate risks, addressed in the Project Field Operation Procedures (GHD, 2003d) and Emergency Response Guidelines (GHD, 2003a).

Key risks, management actions and the effectiveness of the outcomes are summarised in Table 4. As a result of these actions, the Project risks were effectively mitigated and managed.

Table 4: Effectiveness of Risk Management Actions

Risk	Actions	Effectiveness
Lack of PIC Government support	Association with SPREP Signing of inter-government MoU between Australia and each PIC	Association with SPREP afforded the AMC with a central contact point for information dissemination and interaction with PICs, which aided effective initiation and on-going PIC Government support for the Project. SPREP provided the AMC with contextual understanding of the regional initiatives and challenges facing PICs.  While SPREP provided an effective link with departmental level staff, the signing of inter-government MoU between GoA and each PIC confirmed, defined and formalised support for the Project at the diplomatic level.
Australian public opposition	Implementation of Communication Strategy	Management of Australian public approval and support of the Project was achieved with an effective communications strategy. As part of this strategy, the Project was communicated and discussed with key stakeholders prior to commencement, allowing stakeholder comments to be considered in the Project development stage. The stakeholders were kept informed and involved with all relevant project details. When invited to contribute to this report, one stakeholder offered the following contribution:  <i>"The POPs in PICs project is proof that communities can be properly consulted. The communication strategy has not only benefited the Narangba community; it has benefited the government, businesses and the environment. We are very happy to be able to support the aim of reducing the risk of POPs on our Pacific neighbours and at the same time have transparent processes to make sure the project was not to the detriment of Australian communities "</i> (Jell, 2008).
POPs cannot be collected due to challenges associated with in-country operational environments, such as security issues (civil unrest), bad weather (cyclonic type) or other	Monitoring weather conditions and potential natural hazards, monitoring the security situation in each PIC including DFAT travel advisories, consultation with SPREP and local authorities,	The response to high risk operational environments in PICs included:  <ul style="list-style-type: none"> <li>▶ Rescheduling of the POPs cleanup in the Solomon Islands due to ethnic tension (2004-2005);</li> <li>▶ Monitoring of repackaged POPs in Vanuatu during</li> </ul>

Risk	Actions	Effectiveness
extraneous influences (earthquake, volcanic eruptions, tsunami, labour disputes).	regular review of entry Visa requirements.	Cyclone Ivy (February 2004); and <ul style="list-style-type: none"> <li>• Monitoring weather conditions closely during the Pacific cyclone season (November – April).</li> </ul>
<b>Security of repackaged POPs between reconnaissance and cleanup.</b>	The importance of maintaining the POPs in a secure storage location was communicated to local authorities in all PICs.	At the stage of the reconnaissance, chemicals were inventorised. The Team explained to environment and health staff the importance of keeping chemicals and transformers secure until the clean up phase. This was an effective means of securing inventorised POPs between the reconnaissance and cleanup with the exceptions: <ul style="list-style-type: none"> <li>• In Nauru, one transformer was removed prior to collection (refer notes to Table 3 for details), indicating more needed to be done to protect wastes with potential economic value, as anecdotal evidence indicates the transformer was sold for scrap.</li> <li>• In Fiji, as a result of an assessment of very high risk to the repackaged POPs, a security guard was employed to ensure security of repackaged POPs.</li> </ul>
<b>Additional POPs and intractable pesticides identified.</b>	A process of assessment was implemented, including clear identification of the chemicals, review against the Project scope and BCD acceptance requirements; assessment of barriers to collection and shipment, and seeking of AusAID approval for additional project expenditure (where the cost was significant).	The need for this process was noted after the Fiji, Tonga and Cook Islands, FSM and Marshall Islands cleanups and was implemented from the Niue cleanups onwards. The process was effective in defining chemicals that could be included and those that could not.  An additional 9.4 tonnes of POPs was included in the Project (not previously identified in Phase 1), further contributing to the Project goal.
<b>POPs cannot be accepted by disposal facility.</b> The risk that the destruction facility refused acceptance of POPs imported to Australia.	Managed through the development of detailed POPs manifest and approval by the destruction facility, and QEPA, prior to shipping the POPs from the Pacific. Where chemicals were unknown (i.e. not labelled), 50 mL samples were collected and analysed for a broad screen of contaminants prior to inclusion in the Project.	BCD accepted all POPs imported under the Project.  Note, as a result of this process some pesticides had to be excluded from collection under the Project. A small number of pesticides identified contained metal concentrations in excess of BCD acceptance criteria, and therefore could not be included in the Project.
<b>Disposal facility does not operate satisfactorily.</b>	The risk of the destruction facility operating outside permit requirements was monitored by a third party emissions monitoring contractor. Over the course of the Project, four monitoring events were undertaken at the destruction facility, during the destruction of POPs from the Pacific.	One trade waste breach was identified at BCD during the destruction process (refer notes to Table 3 for details). Following this breach, the destruction process was halted and the incident was investigated, reported and the causes of the breach rectified before destruction was allowed to recommence.  All subsequent third party emissions monitoring were within BCD's accepted licence parameters.

### 3.2.2 Procurement

Project procurement comprised 56% of the total budget (see Table 2). Procurement has been defined (based on the original contract) to include all reimbursable costs, procurement include shipping, special insurances, disposal costs (destruction), cleanup and local transport. and costs associated with PCC meetings<sup>8</sup>.

- ▶ **Shipping:** Including logistics management services, shipping costs comprised 26% of the total budget. Shipping costs escalated over the duration of the project due to changes in commercial shipping routes, the requirement for chartered shipping vessels and escalation in the price of petroleum.
- ▶ **Special Insurances:** Comprised 3% of the total budget and provided continuous cover of the total duration of the project. No claims were required to be made against these insurances.
- ▶ **Cleanup costs and local transport:** comprised approximately 10% of the total Project budget, and was broadly categorised into: field equipment (consumables and assets) and demurrage / rental costs.
  - ▶ Field equipment items procured included personal protective equipment, spill cleanup equipment, field tools, drums and drum-liners for repackaging and first aid kits. All significant capital purchases (defined as having value of AUD 1,000 or more) were recorded on the Register of Project Assets. Relative to the project budget, procurement of the required field equipment assets and consumables was minimal due to the practical, low-tech methodology applied to cleanup and repackaging activities.
  - ▶ Demurrage and rental costs primarily related to CHEP boxes and pallets required for shipping transformer casings. These demurrage and rental costs were calculated monthly and settled at the completion of the rental term, generally following transport of the POPs to the destruction facility. With extension to the project timeline, final costs for rental and demurrage were significantly higher than initially forecast. Improvements in the management of these costs may have been achieved with an evaluation of the cost of renting versus purchasing (and subsequent re-sale) of containers and boxes. Although the Project proposed procurement of the containers, the shipping contractor advised this was not possible after rental agreements had been initiated.
- ▶ **Disposal:** Costs associated with the destruction of POPs comprised 16% of the Project budget. Cost was charged based on the weight of POPs destroyed. With the inclusion of additional POPs (to those identified in Phase I) the cost for destruction increased.
- ▶ **PCC Meetings:** Three PCC meetings were held, comprising 1% of the budget. In all cases, PCC meetings were held in association with regional conventions meetings to maximise the attendance in a cost-effective manner.

### 3.2.3 Sourcing and Management of Technical Assistance

Technical assistance included the following contractors, the first three being integral to the JMC and Project implementation:

- ▶ Hatlar Environmental Pty Ltd (cleanup contractor);
- ▶ HK Logistics Pty Ltd (logistics contractor);
- ▶ BCD Technologies (disposal facility);
- ▶ Airlabs Pty Ltd (third-party emissions monitoring contractor, under the Communications Strategy Contract); and

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<sup>8</sup> Some shipping, clean up and local transport and disposal costs were included as part of milestones.

- MGT Laboratories (analytical services).

The contractors included in the JMC were sourced prior to Project commissioning. The disposal facility was specified by AusAID in the PDD. The cleanup and logistics contractors were commissioned by GHD. Outside the JMC, the contractors were sourced through a competitive tender process in accordance with the AusAID Procurement Guidelines.

### **3.2.4 Monitoring by different parties and appropriate management decisions taken in response to emerging issues**

Project monitoring events included: AusAID, SPREP and JMC feedback on Project Reports (monthly exception reporting, six-monthly reports, annual plans and reports, project milestone reports), SPREP Audit of BCD Technologies, SPREP monitoring of in country cleanups, AMC internal audit of logistics compliance, and AMC internal quality assurance review.

Lessons learned from monitoring events were documented and communicated throughout the Project and appropriate responses incorporated into the Project. Management decisions taken in response to emerging issues included:

- The JMC identified early in the Project that materials manifested in the Country Plans were not always representative of the actual material requiring collection within the Project framework (GHD, 2004a). This required an extension of the scope of the reconnaissance missions to ensure development of accurate manifests and to ensure BCD's prior acceptance of the manifest before the clean-up mission.
- Recommendations in the AMC's Logistics Audit Report (GHD, 2006a) included making improvements in communicating the Emergency Response Guidelines and hazardous waste labelling practices. These were subsequently incorporated into the Project approach.
- Through internal QA the AMC identified need for review and verification of BCD's acceptance and weighing procedures, when destruction quantities were deemed greater than field estimates of manifested quantities.
- Through internal QA the AMC identified need to strengthen contractual arrangements with HK Logistics in order to ensure more accuracy in forecasting logistics related costs.
- Third party monitoring identified a trade waste breach. Actions were taken in response to the trade waste breach at BCD as detailed in Table 3. These actions resulted in additional control measures being implemented by BCD. An additional third party monitoring event was added to the program following this breach.
- DEWHA recognised the challenges experienced in partner countries completing Waigani paperwork and delivering original copies to Australia from the Pacific in a timely manner. DEWHA allowed electronic copies of paperwork, on the condition that originals would subsequently be received, resulting in a much more streamlined approval process. The AMC subsequently completed forms on PICs behalf and sent the forms to PICs for signing.

### **3.2.5 Joint Management Committee supervision of the initiative, level of ownership, and capacity to provide bilateral support and guidance**

The JMC provided review and supervision, coordinated support and maintained regular communication throughout the Project. The JMC was a forum where all parties within the Project team could discuss their requirements and operating constraints, identify risks, and apply the combined experience of the team to problem solving. A member from each of the JMC companies, with the exception of BCD, was present for each in-country reconnaissance and cleanup, providing specialist hazardous waste and logistical advice under the direction of the AMC team leader.



The AMC acted as a communication focal point for the Project, providing bilateral support and guidance to PIC governments as requested, as well as regular liaison with SPREP, and contractors, via in-country meetings and regular electronic communication.

The AMC maintained clear ownership of the Project on behalf of AusAID, including advocating the Project outcomes to the PIC governments and community via press conferences, to the Australian and international community through AusAID facilitated media releases, and presentations at national and international conferences and conventions.

### **3.2.6 Coordination with other activities by the partner government or other donors**

For many countries the Project manifest formed the basis of inventory development under the Stockholm Convention National Implementation Plan (NIP), GEF-funded enabling activities. NIP development led to the development of action plans for other POPs-management related issues including customs legislation, enforcement, on-going use, residual stockpiles, and unintentionally produced POPs.

The Project was implemented in coordination with Waigani and Basel Secretariat mandates, and provided PICs with experience in undertaking the approval process for transshipment of hazardous waste.

The outcomes of the Project will be shared with partner governments and donors. Several donors have expressed interest in identifying the next steps following the completion of the Project. The GEF-PAS has proposed a POPs monitoring and integrated hazardous waste including POPs initiatives for 2009 (Faulalo, 2008) and the Agence Française de Développement (AFD) is undertaking a feasibility study including assessing subregional activities on hazardous waste management.

### **3.2.7 Partner government fulfilment of responsibilities in the MoU including staffing and other resources, support from officials**

The primary responsibilities of partner governments included facilitation of site access and approvals, customs clearance of equipment, availability of counterpart staff for training, technology transfer activities and to provide a communication focal point. In general, the partner governments fulfilled these requirements and provided a valuable contribution to the Project implementation, through providing the team with local on the ground knowledge.

One of the initial assumptions in the Project was that PIC counterparts would provide vehicle transport to sites. However, PIC government departments were often over-stretched and under-resourced. As a result vehicles were not made available and the Project hired in-country transport.

## **4. EFFICIENCY**

### **4.1 COST-BENEFIT ANALYSIS**

A cost-benefit analysis was not undertaken *ex ante* in the design process and therefore a cost-benefit analysis cannot be completed *ex post* due to the lack of baseline and ongoing cost-benefit data. A qualitative consideration of cost-effectiveness is a more appropriate methodology. Such an approach requires monetising only the Project's cost and an analysis of whether the costs of an intervention can be justified by the magnitude of net outcomes.

The total cost of the Project and the Communication Strategy was AUD 6.57 Mil. The direct tangible benefit was the removal and destruction of 124 tonnes of scheduled POPs and intractable pesticides.

Less tangible benefits included the reduction in the negative impacts of waste. The negative economic impact (costs) of poor waste management in selected PICs was analysed under the International Waters Project (IWP, 2006a, 2006b, 2006c, 2006d). The IWP highlight the significant costs (up to 1%

PIC country GDP) of poor waste management practices in terms of reduced revenue from fishing and tourism, costs to Government, the health sector and environmental costs. Poorly managed stockpiles of POPs and intractable waste can impact directly and indirectly on economic development through:

- negative effects on human health and the environment (eco-toxicological effects), resulting in healthcare costs and loss of work days due to sickness; and
- contamination of food supplies (primarily fisheries sector for PICs), which can have negative impacts on subsistence economies, local markets and export revenues.

Further benefits were achieved through the increased capacity of PIC government staff (see Section 5.3), dissemination of information regarding practical application of the Basel, Waigani and Stockholm Conventions, and encouragement of inter-governmental and inter-departmental co-operation (see Section 3.2.6).

## 4.2 VALUE FOR MONEY

With a total Project cost of AUD 6.57 Mil and 124 tonnes of POPs destroyed, the approximately cost following final POPs destruction was AUD 53 per kilogram. Considering the challenges associated with the Project, this unit cost is considered efficient as it includes management, collection, repackaging, approval, shipping and destruction of POPs from twelve Pacific countries.

The following efficiencies in the Project approach are considered key contributors to the low unit cost:

- **Regional approach:** The regional approach to the Project (rather than a country-by-country basis), represented a least-cost solution due to the reduced transaction costs and administrative burden significantly alleviating replication of contracts, approvals paperwork and communication. Cost efficiencies in travel were also achieved, through visiting several countries per visit.
- **Effective planning and communication:** Planning and communication during the initial stages of the Project (see Section 2) was successful in gaining approval and support from key stakeholders who could have created delays if not given an opportunity to have their concerns addressed early in the Project's design. This communication and planning laid the foundations for efficient Project implementation. Additionally, efficiencies were borne out through close communications between AMC and DEWHA, DAFF, QEPA and other government agencies.
- **Practical cleanup solutions:** Practical techniques were applied to in-country POPs cleanup and repackaging works (see Section 2), which were cost efficient, adaptable and allowed a high degree of mobility.
- **Clearly defined scope:** The scope clearly defined the intractable wastes to be included in the Project (see Section 2). The enforcement of the clearly defined scope provided focus to the Project, which could have deviated to several other toxic chemical and hazardous waste related issues in the Pacific. This targeted focus allowed for highly efficient project implementation.
- **Alignment with complementing programmes and initiatives:** Other programmes and initiatives complemented the Project implementation, most significantly the GEF Operational Programme on POPs, which provided funding to PICs party to the Stockholm Convention for the development of NIPs. These programme funds aided the awareness raising and capacity building activities of the POPs in PICs Project.

### 4.2.1 Contract Variations

AusAID approved four cost variations over the term of the Project as detailed in Table 5, primarily as a result of:

- ▶ Changes to commercial shipping routes and requirement for charter vessels to complete the Project. Charter vessels were required in Solomon Islands and FSM for the collection of repackaged POPs. This requirement arose due to cancellations of previously existing commercial shipping lines.
- ▶ Inclusion of stockpiled POPs and intractable waste in addition to that identified in Phase 1. As detailed in Table 3, an addition of approximately 10% by weight of POPs was included by the completion of cleanup works, requiring additional cleanup and destruction budget; and
- ▶ Project schedule extension due to delayed MoU agreement and delays in Vanuatu ratification of the Waigani Convention. Schedule extensions resulted in additional costs for project management, storage and demurrage. Project demurrage costs proved to be an expensive component, and as such, future projects might consider: 1) purchasing containers, rather than leasing, where project timelines are likely to be extended removing demurrage costs; or 2) defining lay times in contracts of affreightment to reduce demurrage costs.

While these variations provided additional benefits to the Project through the inclusion of additional POPs, they also in part represent areas for improvement in Project management, which could increase the Project cost-benefit efficiencies.

Table 5: Project budget with approved cost variations

GoA Expenditure Item	Original Contract	Variation 1	Variation 2	Variation 3	Variation 4	Actual Expenditure at Completion
Management, Milestones, Insurance and PCC	1,462,081	2,393,305	2,592,320	2,688,526	3,056,702	2,821,015
Shipping	804,930	1,391,947	1,665,013	1,695,829	1,700,838	1,714,059
Clean up costs, local transport and procurement	677,690	356,690	665,067	632,850	580,980	682,257
Destruction costs	1,154,766	1,294,212	1,309,032	1,214,227	1,092,912	1,042,872
Communications	260,000	310,000	310,000	310,000	310,000	308,327
<b>TOTAL</b>	<b>4,359,467</b>	<b>5,746,154</b>	<b>6,541,432</b>	<b>6,541,432</b>	<b>6,741,432</b>	<b>6,568,530</b>

## 5. IMPACT AND SUSTAINABILITY

The projected long term changes (impacts) resulting from the Project are discussed in the following section with reference to evidence-based indicators, where possible, and likely consequences.

### 5.1 ACCELERATING ECONOMIC GROWTH AND REDUCING POVERTY

Poverty in the Pacific is induced by vulnerability caused by detrimental circumstances, often environmental and economic, which impact negatively on lives and on the ability to meet basic needs (EC, 2003). Consequently, improvement in the quality of PIC environments has a direct effect on poverty reduction and economic growth. Australia recognises these strong linkages between poverty and the environment (AusAID, 2001).

The likely consequences of these positive environmental impacts of the Project (see Section 5.2.2) are increased public health, reduced health care costs, improved health of the workforce, reduced threat to

contamination of aquatic life (which supports the fishing industry<sup>9</sup> and potentially impacts positively on the tourism industry).

Positive impacts resulting from the Project are likely to have the most significant effect on the more impoverished communities, who rely on the environment for traditional food sources (fish and small-scale agriculture) and drinking water (groundwater and surface water). Increased environmental quality and standard of health promotes development opportunities for the more impoverished, assisting in the reduction of poverty (AusAID, 2001).

The total population of the 12 PICs included in the Project was 2,199,796 in 2006/2007 (DFAT, 2008). It is not possible to estimate the number of people impacted by the Project with the available information, however the persistent nature of POPs and their ability to travel long distances suggests that negative impacts of the chemicals, had they been released to the receiving environment, would have been significant.

Therefore the positive impact of mitigating risk is significant, and economic growth and poverty reduction are indirect benefits.

## 5.2 CROSS-SECTORIAL IMPACT

### 5.2.1 Gender Equality

Women were well represented on the Project in stakeholder engagement processes, as part of the JMC, at PCCs and in training and capacity building exercises. Forty-three women are listed on the Project personnel and stakeholders list (Annex 1), which represents 30% of Project personnel and stakeholders.

The scope of the Project did not specifically target gender equality issues<sup>10</sup>. However, it is noted that POPs have the capacity to accumulate in human body fat, including breast tissue, and can be passed down to younger generations through breast-feeding and during pregnancy. Therefore, the positive impact of a reduced threat of POPs on human health is biased in favour of women.

### 5.2.2 Environmental Impacts

As indicated throughout this report, the Project had direct positive impacts on the environment. These impacts can be divided into two broad achievements:

- The removal of 124 tonnes of POPs and intractable pesticides from the environment of 12 PICs, an environment that has been noted to be highly vulnerable to contamination and home to areas of significant biodiversity. The removal of these stockpiles of chemicals has reduced the threat to the local and global environment. This includes a reduction in the risk of POPs contamination of surface water, groundwater, marine waters and land; and
- Disposal of these POPs and intractable pesticides utilising environmentally sound, best practise technology.

Sustainability of the positive environmental impacts was inherent in the Project, in that the POPs were destroyed and consequently this outcome will be 100 percent sustained. However, the potential remains for new stockpiles of POPs, or more likely other intractable pesticides to accumulate in the PICs over time and the Project did not address this issue.

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<sup>9</sup> AusAID recognize that the future of Pacific island subsistence and market economies is tied to the health of their fisheries (AusAID, 2007, p1).

<sup>10</sup> The key objectives of AusAID's gender policy are: improved economic status of women; equal participation of women in decision making and leadership, including in fragile states and conflict situations; improved and equitable health and education outcomes for women, men, girls and boys; and gender equality advanced in regional cooperation efforts.

Anecdotal evidence from in-country discussions with PIC government personnel indicates accumulation of chemicals occurs due to donations of pesticides through aid programs and over-ordering of pesticides by departments. To avoid the accumulation of new POPs, appropriate customs controls must be developed and implemented. Further ratification and implementation of relevant international conventions including the Rotterdam Convention on Prior Informed Consent will assist PICs with developing procedures and receiving information on imports of hazardous chemicals. NIPs should in theory identify any gaps in legislative and enforcement capabilities in this regard, however funding to implement strategies in the NIPs is limited.

Potential negative environmental impacts of the Project relate to the greenhouse gas emissions generated throughout Project duration including air and land travel, shipping and destruction activities. A calculation of these emissions was undertaken (see Annex 3), resulting in an estimate of 339 tonnes of CO<sub>2</sub> equivalent emissions resulting from the Project implementation.

### 5.2.3 Cross-Cutting Governance Issues

Management of POPs and intractable waste issues in the PICs has required inter-governmental and some intra-governmental cooperation between Ministries and Departments of Environment, Agriculture, Public Works and Health. The Project has required communication and cooperation between competent authorities under the Basel or Waigani conventions of all PICs. The Project has also required close cooperation between AusAID and DEWHA. Corruption and human rights issues were not encountered.

### 5.2.4 Partnership and Promotion of Regional Stability and cooperation

During the PCC meeting in May 2008, country representatives identified that understanding the practical application of provisions under multilateral environmental agreements (MEAs) of the Basel and Waigani Conventions was invaluable. Many also suggested the Project jump-started their implementation of provisions under the Stockholm Convention. The Project also encouraged countries to ratify Basel or Waigani. At the commencement of the Project, six PICs were not party to either and at completion all but Palau had ratified one of these conventions. The promotion of ratification of MEAs contributes to regional and international partnerships.

## 5.3 LONG TERM CAPACITY DEVELOPMENT

The Project's contribution to capacity development included:

- Contribution to knowledge building in obligations, mechanisms and processes under the Waigani, Basel and Stockholm conventions. Specifically, the following contributed directly to capacity building:
  - 1) a workshop with PIC competent authorities on Basel and Waigani Convention requirements associated with the Project (Nadi, Fiji, 26-30 May 2003 attended by 10 PIC representatives);
  - 2) distribution of transshipment proforma and approval process information for the Basel and Waigani Convention; and
  - 3) meetings held in each PIC with competent authorities and relevant government staff to reiterate the transshipment approval process.
- Contribution to increasing knowledge and awareness of appropriate hazardous chemicals management and storage, including:
  - 1) on-the-job training of government staff during cleanup works; and
  - 2) media releases and press conferences to publicise the Project and promote safe management of hazardous chemicals.

The successful capacity building contribution of the Project was highlighted by PIC delegates who attended the 2008 PCC meeting (Annex 3), noting that the Project had:

- ▶ Raised awareness of POPs;
- ▶ Improved partner government understanding and intergovernmental communication;
- ▶ Encouraged partner government departments to work closer together in order to remove waste; and
- ▶ Helped countries become aware of obligations under international conventions.

However, PIC representatives also highlighted their preference for an additional training component as an area for improvement to the project-approach delivery.

## 6. RELEVANCE

### 6.1 THE INITIATIVE OBJECTIVES

The Project objectives addressed regional and international priority issues, evident from the alignment of the Project goal with one of the highest priority waste management issues in the Pacific as identified in SPREP's Waste Management Action Plan 1997-2000, and in the Stockholm Convention.

The objectives of the Project were clear, allowing for the distinct separation of what could and couldn't be included in the cleanup, which contributed to Project success.

The Project was developed in accordance with AusAID's Pacific Regional Aid Strategy 2004-2009, including making positive steps towards improvement of drinking water quality, protection of marine resources, and promoting stabilisation of the region. In addition, the Project contributed towards Australia's commitments under Article 12 of the Stockholm Convention on provision of Technical Assistance.

### 6.2 FORM OF AID

In regard to relevance, the choice of FoA (project support-approach) has proven to be an appropriate response to the threat of POPs and intractable waste on human health and the environment<sup>11</sup>. The clear nature of the problem, the threat of POPs, was well suited to an outcome-driven AMC-managed project-approach. Strengths of the project-approach included efficiencies in POPs collection, packaging and shipping, effective management of destruction contracts and effective management of Australian, Basel and Waigani approval requirements.

Furthermore, association with SPREP as a regional partner provided several benefits including maintaining alignment with country and regional strategies.

With regard to sustainability, the FoA complemented the GEF Operational Programme on POPs including the development of country NIPs. Association with SPREP is likely to have increased sustainability and local ownership of project achievements through on-going SPREP programs, coordination and communication. Association with SPREP has also been valuable to SPREP's profile in the Pacific.

### 6.3 MANAGEMENT AND INSTITUTIONAL ARRANGEMENTS

The strengths of the contract include a clear scope of services with a clear definition of "scheduled POPs and intractable pesticides" for disposal, clearly defined roles and responsibilities, components and objectives.

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<sup>11</sup> AusAID's activity design guidelines (AusAID, 2005) outlines that the aid modality of project support is appropriate when: a) "Externally sourced short-term technical expertise is the key input to address what are primarily technical issues/problems"; and b) "A regional response is required – such as on environmental, health or security issues (i.e. it is a trans-boundary issue which requires coordination and management outside/in addition to any one country's established systems and institutions)."

The MoUs were appropriate for Project delivery and a suitable level of support and involvement was received during implementation from PICs partner government staff.

## 7. LESSONS LEARNED

The following summarises the overarching lessons learned.

- ▶ **The Project schedule needs to be flexible:** Flexibility in the Project schedule was an integral component of the management of project risks including security issues, changes in shipping routes, variable approvals completion timing, countries ratification of relevant Conventions. Flexibility was built into the Project through regular communication (on-going regular stakeholder updates throughout the project) and a practical low-tech approach to collection and packaging, as well as through the flexibility of AusAID to increase the cost and the implementation time of the Project.
- ▶ **Initial reconnaissance is essential for cleanup planning:** The initial reconnaissance visit conducted in each PIC to inspect, confirm and test POPs, also served to allow meetings with officials in each participating PIC to discuss in detail the international legal requirements relating to the repackaging and shipment of wastes; and extensive discussions with authorities and NGOs relating to chemicals management and hazardous waste transport approvals processes. It was recognized by project stakeholders that the benefits of the reconnaissance stage exceeded expectations. Relationships and increased awareness established during the reconnaissance have contributed significantly to the success of the project (Boomer, 2006).
- ▶ **POPs volumes increase with growing awareness:** The volume of stockpiled POPs and intractable waste increased over the duration of the Project as awareness of the collection activities was communicated via local media and through government channels.
- ▶ **The complexities of export import process take time to negotiate:** The Waigani and Basel approvals process required significant upfront planning, capacity building of the PIC's government agencies and on-going communication with PICs and DEWHA, all of which required more time than expected. This was true also of the other import permit processes for DAFF, Customs and AQIS, which were dependent on the DEWHA approvals.
- ▶ **Independent disposal facility emission monitoring is important to ensure compliance and demonstrate transparency to all project stakeholders:** Even the best available technologies should be subject to third party monitoring, as learned from the detected trade waste breach at BCD. Despite regular local government monitoring, third party monitoring was required to make the results available to stakeholders. Following the detection of this breach, improved processes were put in place at the facility to reduce the risk of any further breach.
- ▶ **Effective communication with stakeholders provides significant project efficiencies:** The positive cooperative foundations developed with all stakeholders as a result of the Communication Strategy were maintained throughout the Project, and played a significant role in implementation success.

## 8. OVERALL CONCLUSIONS

### Effectiveness

The Project made a significant contribution to ridding the participating PICs of scheduled POPs and intractable pesticides. All reported scheduled POPs and intractable pesticides accessible to the team were removed from the PICs and destroyed in an environmentally sound manner, providing a highly effective reduction of the threat of these toxic chemicals to human health and the environment.

## Efficiency

With a total Project cost of AUD 6.57 Mil and 124 tonnes of POPs destroyed, the approximate unit cost following final POPs destruction was AUD 53 per kilogram. Considering the challenges associated with the Project, this unit cost is considered efficient as it includes the management, collection, repackaging, approval, shipping and destruction of POPs from 12 independent countries. Cost efficiencies were achieved through a regional approach to implementation, effective planning and communication, practical cleanup solutions, clearly defined scope, and alignment with complementing programmes and initiatives. Areas for efficiency improvements include reducing the project duration and reducing container demurrage costs.

## Impact and Sustainability

A positive and sustainable impact was made by improving the environment through the reduction of the source of POPs contamination. Secondary impacts included poverty reduction and economic growth through contributions to improved environmental quality and human health, promoting partnerships through the implementing provisions of MEAs, and long-term capacity development through information sharing and informal training.

## Relevance

The Project goal addressed country, regional and international priority issues, and was in alignment with the highest priority waste management issues in the Pacific as identified by SPREP member countries in the Waste Management Action Plan 1997-2000, and the objective of the Stockholm Convention.

## Future Actions

Suggested future actions include:

- Undertake collection and safe disposal of other hazardous waste identified in Phase I and during the course of Phase II that could not be collected under the Phase II scope. It is noted that the Phase II Project addressed about 30% of the hazardous waste identified in Phase I. Remaining hazardous wastes include timber treatment chemicals (copper-chrome-arsenate), school chemicals, disused pharmaceuticals, medical waste, asbestos, bitumen, contaminated sites, and buried POPs and intractable waste. This should be undertaken in line with PIC NIPs and SPREP Solid Waste Management Strategy for the Pacific Region (SPREP, 2005). The AMC also prepared an "additional chemicals list" listing chemicals identified, but unable to be collected under the Project. Further work on chemicals on this list is recommended.
- Testing of online transformers. Online transformers were not tested under the POPs in PICs Project. Transformers commissioned earlier than 1980 are likely to contain, or have contained PCB-contaminated oil. In most PICs, old transformers are still in operation in some areas. Whilst these are unlikely to contain high concentrations of PCBs, due to top-up of oil contamination, residual contamination is likely.
- Undertake a review of the region's National Implementation Plans and design further regional projects to address common issues.
- Undertake training and capacity building to formalise and develop skills gained by the participating PIC government agencies during the Project in the documentation, management, safe storage and disposal of hazardous waste.
- Support to develop appropriate legislation and management systems to identify any remaining sources, track importation and export, sale, use, and disposal of hazardous materials and chemicals, including appropriate labelling.
- The project design document (AusAID, 2002 p26) noted "*PNG was not included in Phase II, though it is expected that a future project could use the same methodology to work with PNG to remove POPs*". PNG has expressed a request for support for such a project.



- Further work should also be considered in the control of unintentionally produced POPs, primarily dioxins and furans, which were highlighted as a priority issue by UNEP in 2002 (UNEP, 2002). Major sources of dioxins and furans in the Pacific come from vehicle emissions and informal incineration practices, such as domestic waste burning. An initiative to address dioxins and furans may involve education and awareness, although much work has already been completed in this area.

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**ANNEX 1: PROJECT PERSONNEL & STAKEHOLDERS**

**ANNEX 2: PROJECT CHRONOLOGY**

**ANNEX 3: PROJECT COMPLETION REPORT WORKING PAPERS**

**ANNEX 4: PROJECT MANAGEMENT REPORTS**

## ANNEX 1: PROJECT PERSONNEL

### *Australian Managing Contractor Personnel*

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Mr Howard ELLIS	Senior Adviser, Ministry for the Environment
Mr Cedric HORNER	Energy and Environment Group, Ministry of Economic Development
Country Contacts – Marshall Islands	
Mr Ronney AREALONG	POPs Coordinator, Environment Protection Authority
Mr John BUNGITAK	General Manager, Environment Protection Authority
Mr Stephen LEPTON	POPs Coordinator, RMIEPA
Country Contacts – Palau	
Mr Donald DENGOKL	Assistant Executive Officer, Environmental Quality Protection Board
Country Contacts – Papua New Guinea	
Ms Katrina SOLIEN	Acting Manager – EIA, Department of Environment and Conservation
Country Contacts – Samoa	
Mr Bill CABLE	Project Coordinator POPs
Mr. Taulealeausumai LAAVASA MALUA	Assistant Chief Executive Officer, Planning and Urban Management Division, Ministry of Natural Resources and Environment
Ms. Fuatino MATATUMUA	Principal POPs/PIC Officer, Ministry of Natural Resources and Environment
Mr. Aiono MOSE POUVI SUA	Chief Executive Officer, Ministry of Foreign Affairs and Trade
Ms. Katenia RASCH	Waste Management Officer, Ministry of Natural Resources and Environment
Dr. Ieti TAULEALO	Chief Executive Officer, Ministry of Natural Resources and Environment
Country Contacts – Solomon Islands	
Mr Moses BILIKI	Director, Environment and Conservation Division, Ministry for Forests, Environment and Conservation
Mr Mike HEMMER	HK Logistics Agent
Mr Joe HOROKOU	Director (Ag), Environment and Conservation Division, Ministry for Forests, Environment and Conservation
Mr Tia MASOLO	POPs Coordinator, Ministry of Environment, Conservation and Meteorology
Mr Fred PATISON	Chief Environment Officer, Environment and Conservation Division, Ministry of Environment, Conservation and Meteorology
Country Contacts – Tonga	
Mr Asipeli PALAKI	Head, Department of Environment
Mr Uilou SAMANI	Director, Department of Environment
Mrs Suliana N.M. VI	N.P.C. Department of Environment
Country Contacts – Tuvalu	
Mr Melton TAUETIA	Coordinator POPs Environment, Ministry of Natural Resources, Energy and Environment

Mr Mataio TEKINENE	Ministry of Natural Resources, Energy and Environment
Ms Susan TUPULAGA	Waste Coordinator, Government of Tuvalu
Country Contacts – Vanuatu	
Mr Ruben MARKWARD	Executive and Planning Officer, Ministry of Agriculture Quarantine Forestry and Fisheries
Mr Kaltuk KALMOR	Senior Laboratory Technician, Quarantine and Inspection Services
Mr John SMITH	HK Logistics Agent
Mr Benuel TARILONGI	Director, Department of Quarantine and Inspection Services
Mr Albert TOA	Department of Quarantine and Inspection Services
Mr Timothy TUMUKON	Principal Plant Protection Officer, Department of Quarantine and Inspection Services
Mr Michael VARI	POPs Coordinator
Mr Jeffrey WILFRED	Director General, Ministry of Quarantine, Agriculture, Fisheries and Forestry
Multi-lateral Contacts	
Mr Keneti FAULALO	GEF PAS coordinator, United Nations Environment Programme
Mr Andrew HUDSON	United Nations Development Programme
Mr Frank MOSER	Associate Programme Officer, UNEP Chemicals
Mr David OGDEN	Executive Coordinator, Secretariat of the Stockholm Convention on POPs, United Nations Environment Programme
Dr. David PIPER	Task Manager (POPs enabling activities), Division of GEF Coordination, United Nations Environment Programme
Ms Elena SOBAKINA	UNEP Chemicals
Mr Anil SOOKDEO	Programme Specialist - Montreal Protocol Unit, UNDP Regional Centre in Bangkok
Mr Patrick TUIMALEALI'IFAN	United Nations Development Programme
Australian Communication Strategy Stakeholders	
Ms Lyn ALLEN	Queensland Premier's Department
Dr Peter BROTHERTON	Australian Conservation Foundation
Mr Jason COLLINS	Greenpeace
Ms Mary DONLEVY	Senior Project Manager and Environmental Health Adviser, Environmental Health Unit, Queensland Department of Health
Mr Drew HUTTON	Australian Greens
Mrs Fran JELL	Narangba Community Action Group
Mr Brad KITCHEN	Brisbane Port Authority
Dr Mariann LLOYD-SMITH	National Toxics Network
Ms Jude MUNROE	Brisbane City Council

Mr Rob NOBLE	Caboolture Shire Council
Mr Dave PERRY	Maritime Union of Australia
Mr James PURTILL	Queensland Environmental Protection Agency
Mr Andrew ROUSE	World Wide Fund for Nature
Mr Cam WALKER	Friends of the Earth
Ms Felicity WISHART	Queensland Conservation Council

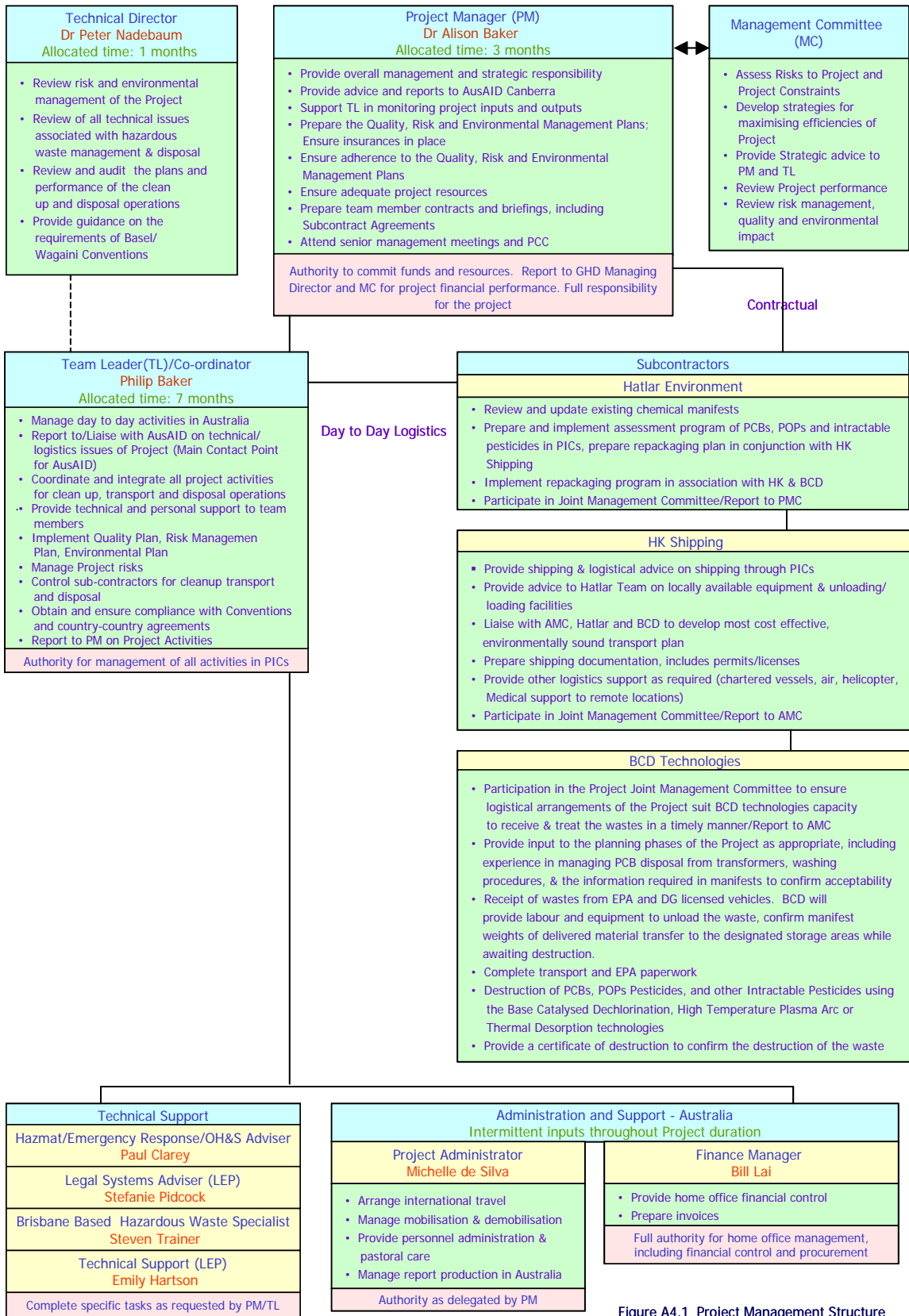


Figure A4.1 Project Management Structure

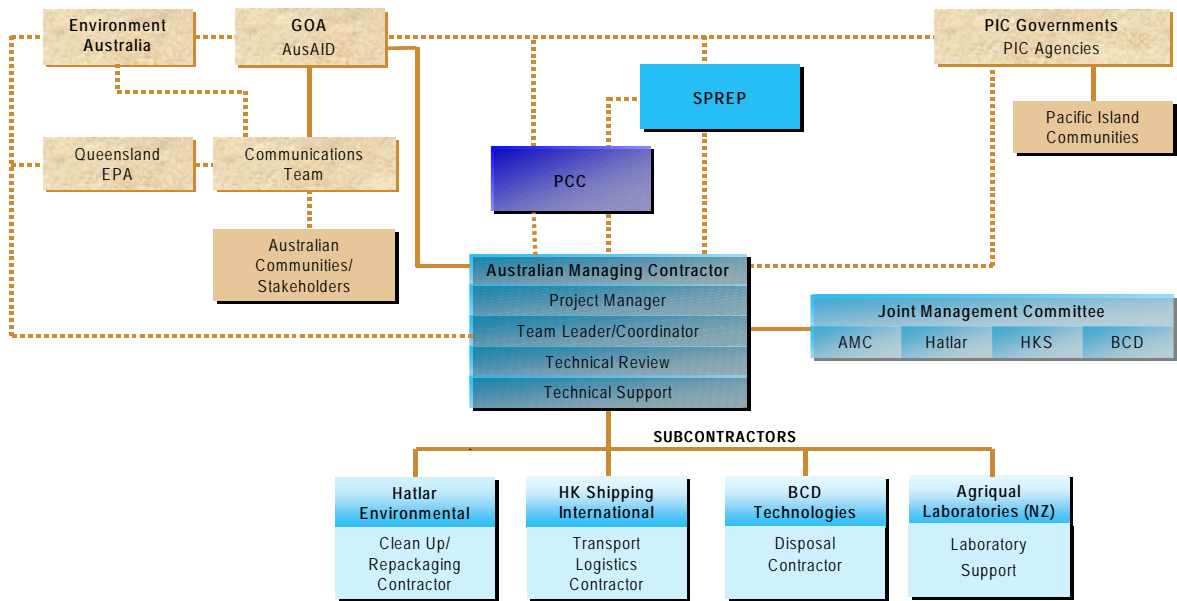


FIGURE A1.1: PROJECT STRUCTURE

## ANNEX 2: PROJECT CHRONOLOGY KEY DATES

Date	Event	Milestone / Output
<b>2002</b>		
18 Nov	Contract 11454 (for POPs in PICs Communication Strategy Implementation) between AusAID and GHD signed and project commencement	
<b>2003</b>		
18 Feb	Report submitted to Environment Australia outlining the results of the Public Consultation	
11 Apr	Contract 11533 (for POPs in PICs Phase II Scheduled POPs and Intractable Pesticide Disposal) between AusAID and GHD signed and project commencement	
09 Aug	Team mobilised to Samoa, Fiji, Vanuatu and Cook Islands to complete reconnaissance visits	
22 Aug	Project Procedures Manual, including Emergency Response Plan, Risk Management Plan and Field Operating Procedures submitted to AusAID	MS 1
14 Sep	Team mobilised to Marshal Islands, Palau, FSM to complete reconnaissance visits	
11 Oct	Team mobilised to Kiribati, Nauru, Niue, Tonga, Tuvalu and Fiji to complete reconnaissance visits	
17 Oct	Permitting Schedule Report submitted to AusAID	MS 2
31 Oct	Reconnaissance visits to all PICs completed (with exception of Solomon Islands)	
<b>2004</b>		
11 Feb	Project Coordinating Committee (PCC) meeting held in Port Vila, Vanuatu	
16 Mar	Transport / Logistics Plan submitted to AusAID	MS 5
16 Mar	Chemical Assessment Plan and Manifest submitted to AusAID	MS 3
12 May	Annual Plan 2004-2005 submitted to AusAID	
17 Jun	Clean Up Plan submitted to AusAID	MS 4
25 Jun	Team mobilised to Samoa for clean up and repackaging	
05 Jul	Samoa clean up and repackaging completed	
22 Aug	Team mobilised to Fiji for clean up and repackaging	
04 Sep	Fiji clean up and repackaging completed	
03 Oct	Team mobilised to Tonga for clean up and repackaging	
08 Oct	Tonga clean up and repackaging completed	
08 Oct	Team mobilised to Cook Islands for clean up and repackaging	
16 Oct	Cook Islands clean up and repackaging completed	
01 Nov	Team mobilised to FSM for clean up and repackaging	
09 Nov	Team mobilised to Marshall Islands for clean up and repackaging	
11 Nov	Marshall Islands clean up and repackaging completed	
17 Nov	Samoa special import permits issued	

Date	Event	Milestone / Output
22 Nov	FSM clean up and repackaging completed	
14 Dec	POPs shipment exported from Samoa	
<b>2005</b>		
04 Jan	Samoa POPs shipment arrived at BCD facility	
10 Jan	Six Monthly Report Period March to September 2004 submitted	
09 Mar	Fiji special import permits issued	
09 Mar	Cook Islands special import permits issued	
11 Mar	Tonga special import permits issued	
02 Mar	Second PCC meeting held in Wellington, New Zealand	
10 Apr	Niue clean up and repackaging completed	
30 Apr	Tuvalu clean up and repackaging completed	
09 Jun	Nauru clean up and repackaging completed	
17 Jun	Final destruction certificate issued for Samoa POPs	
12 Jul	POPs shipment exported from Fiji	
29 Sep	Fiji shipment arrived at BCD facility	
05 Oct	Third party emissions monitoring undertaken at BCD during destruction of POPs	
10 Oct	POPs shipment exported from Cook Islands	
07 Nov	POPs shipment exported from Tonga	
21 Nov	Tonga POPs shipment arrived at BCD facility	
19 Dec	Vanuatu clean up and repackaging completed	
21 Dec	Cook Islands POPs shipment arrived at BCD facility	
<b>2006</b>		
06 Feb	Marshall Islands special import permits issued	
01 Mar	Tuvalu special import permits issued	
10 Mar	POPs shipment exported from Tuvalu	
24 Mar	POPs shipment exported from Marshall Islands	
29 Mar	Cleanup Report for remaining 6 PICs submitted to AusAID	MS 7b
10 Apr	Tuvalu POPs shipment arrived at BCD facility	
11 Apr	Marshall Islands POPs shipment arrived at BCD facility	
01 May	POPs shipment exported from FSM	
04 May	FSM special import permits issued	
22 Jul	Solomon Islands clean up and repackaging completed	
13 Jun	Final destruction certificate issued for Fiji POPs	
01 Aug	FSM POPs shipment arrived at BCD facility	
14 Aug	Niue special import permits issued	
23 Aug	Final destruction certificate issued for Cook Island POPs	

Date	Event	Milestone / Output
23 Aug	Final destruction certificate issued for Tonga POPs	
19 Sep	Cleanup Report for the first 6 PICs submitted to AusAID	MS 7a
21 Sep	POPs shipment exported from Niue	
22 Sep	Import Permit for First 6 PICs Report submitted to AusAID	MS 6a
19 Oct	Final destruction certificate issued for Marshall Islands POPs	
19 Oct	Final destruction certificate issued for Tuvalu POPs	
25 Oct	Niue POPs shipment arrived at BCD facility	
26 Nov	Final destruction certificate issued for FSM POPs	
08 Dec	Kiribati special import permits issued	
26 Dec	POPs shipment exported from Kiribati	
<b>2007</b>		
19 Jan	Kiribati POPs shipment arrived at BCD facility	
13 Feb	Solomon Islands special import permits issued	
17 Feb	POPs shipment exported from Solomon Islands	
17 Apr	Solomon Islands POPs shipment arrived at BCD facility	
25 May	Second third party emissions monitoring undertaken at BCD	
28 May	Final destruction certificate issued for Kiribati POPs	
09 Jul	Third party emissions monitoring for BCD indicated a breach of trade waste permit conditions. Destruction of remaining POPs in PICs materials halted for six months until all parties were satisfied the issue would not reoccur.	
23 Jul	Final destruction certificate issued for Niue POPs	
14 Dec	Cabwater provides letter stating they are satisfied with BCD's operational procedures	
<b>2008</b>		
09 Jan	QEPA (Sunshine Branch) provides letter stating they are satisfied with BCD's operational procedures	
18 Jan	Vanuatu deposits its Instrument of Ratification for the Waigani Convention	
22 Jan	QEPA (Brisbane Branch) provides letter stating they are satisfied with BCD's operational procedures	
16 Feb	Resumption of treatment of POPs in PICs wastes at BCD	
14 Apr	Third party emissions monitoring undertaken at BCD	
24 Apr	Final destruction certificate issued for Solomon Islands POPs	
22 May	Vanuatu special import permits issued	
01 May	Final PCC meeting held in Apia, Samoa	
05 Aug	POPs shipment exported from Vanuatu	
21 Aug	Import Permit for Final 6 PICs Report submitted to AusAID	MS 6b
28 Aug	Vanuatu POPs shipment arrived at Brisbane Port after delays	
19 Sep	Vanuatu PCB contaminated soil container arrives at Steritech for treatment	



Date	Event	Milestone / Output
22 Sep 2009	First Vanuatu POPs container arrived at BCD facility	
06 Jan	Fourth third party emissions monitoring undertaken at BCD	
09 Feb	Fifth and final Vanuatu POPs container arrived at BCD Technologies	
06 Mar	Transport and Logistics Completion Report submitted to AusAID	MS 8
22 May	Final destruction certificate issued for Vanuatu POPs	
14 Aug 2010	Disposal of Shipped Chemicals Report submitted to AusAID	MS 9
Sept	Project Completion Report Submitted to AusAID	

## ANNEX 3: PROJECT COMPLETION WORKING PAPERS

- 3a Logical Framework Matrix
- 3b PCC Meeting Minutes, May 2008
- 3c POPs Destruction Summary
- 3d Project Greenhouse Emissions Estimate

## ANNEX 3a: LOGICAL FRAMEWORK MATRIX

NARRATIVE SUMMARY	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<b>GOAL</b>			
To reduce the threat posed by Persistent Organic Pollutants (POPs) and related chemicals toward the environment and human health in PICs.			
<b>PURPOSE</b>			
To dispose of Polychlorinated biphenyls (PCBs), and PCB-contaminated solvent from transformers, small quantities of PCB-contaminated soil, stockpiled organochlorine pesticides including scheduled POPs and other intractable pesticides (mainly organochlorins and organophosphates), and unidentified pesticides considered likely to fall into those categories in participating PICs.	<p><b>Quantity:</b> PIC monitoring reports, audit report on destruction operation, and project technical report.</p> <p><b>Quality:</b> Detailed description of government roles and extent of participation given in project technical report.</p> <p><b>Time:</b> Project Duration.</p>	Acceptance of clean-up plans by partner government representative and acceptance of project reports by AusAID.	Cooperation and formal agreements obtained from all participating governments.
<b>COMPONENT 1: IN-COUNTRY IDENTIFICATION AND CONFIRMATION OF POPS FOR REMOVAL (SPREP)*</b>			
<b>COMPONENT 2: POPS COLLECTION, PACKAGING AND SHIPPING TO DISPOSAL FACILITY</b>			
<p><b>Output 2.1</b> The AMC will have made contact with Department of Environment and Heritage to initiate the permitting processes required under the Basel and Waigani Conventions, and will have also facilitated the completion of country-to-country agreements that may be required for in-transit activities.</p>	<p><b>Quantity:</b> Checklist prepared by AMC of all required agreements. Letters of agreement or permit applications submitted by each PIC to Australia, and other governments as required.</p>	<p>Completeness of checklist confirmed by AusAID, in consultation with Department of Environment and Heritage.</p> <p>All required agreements, as per checklist.</p>	Assistance by Partner government representatives in each PIC.

\* Component I of the Project was undertaken by SPREP and has largely been completed. Remaining activities for SPREP involve liaison with PICs and monitoring of AMC activities.

NARRATIVE SUMMARY	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<b>Output 2.2:</b> Basel, Waigani or Special Permits obtained, with agreements within and between all participating PICs and Australia.	<b>Quantity:</b> Permits issued by Australia, and other governments as required	Signed permits, crosschecked against checklist.	Governments (especially Australia) agree to the shipping and disposal operation.
<b>Output 2.3:</b> All PCBs, intractable pesticides and associated contaminated materials packaged by Clean-up contractor and prepared for shipping, within each PIC.	<b>Quantity:</b> Audit reports for each PIC by SPREP to confirm operations completed.	Sign-off of Audit reports by Partner government representative.	Assistance by Partner government representatives in each PIC. Also, availability of local paid labour.
<b>Output 2.4:</b> Shipping agreements finalised between the AMC and shipping company or companies.	<b>Quantity:</b> Signed agreements.	Six-monthly reports by AMC.	A suitable shipping company and/or charter vessel is identified.
<b>Output 2.5:</b> All POPs containers with PCBs, contaminated transformers, contaminated soils and other intractable pesticides collected from each PIC.	<b>Quantity:</b> Containers removed.	Six-monthly reports by AMC. Shipping Manifest and Paperwork provided.	No problems due to natural hazards (e.g. cyclones), labour disputes, etc.
<b>Output 2.6:</b> All POPs containers delivered to, and off-loaded at port of final destination.	<b>Quantity:</b> Containers off-loaded at destination port.	Six-monthly reports by AMC. Shipping Papers/Customs documentation	No problems due to natural hazards (e.g. cyclones), labour disputes, etc.
<b>COMPONENT 3: POPS DESTRUCTION</b>			
<b>Output 3.1:</b> AMC will have obtained any permits or approvals required at a State level for POPs import and disposal (NB: This output is a pre-requisite for the import permits covered under Output 2.2).	<b>Quantity:</b> Permits obtained (or written confirmation that permits are not required).	Signed permits.	Disposal facility already has permits in place to accept the waste. Import permits will be granted provided activities comply with appropriate standards (e.g. IMO packaging regulations).
<b>Output 3.2:</b> All POPs containers transported to disposal facility or other agreed storage facility in receiving country.	<b>Quantity:</b> Containers arrive at BCD Technologies	Six-monthly reports by AMC. Delivery and acceptance receipts.	No problems due to natural hazards (eg cyclones), labour disputes, etc.

NARRATIVE SUMMARY	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<b>Output 3.3:</b> All POPs and associated contaminated materials successfully disposed.	<b>Quantity:</b> Treatment processes carried out in accordance with agreed protocols.	Six-monthly and exception reports by AMC and SPREP.  Treatment records provided.	Plant operates satisfactorily.
<b>COMPONENT 4: PROJECT AND CONTRACT MANAGEMENT</b>			
<b>Output 4.1:</b> Effective project management will have operated throughout all of the Component 2 and 3 activities, including regular project reporting (six-monthly and exception reports and Annual Plan to AusAID), facilitation of PCC.	<b>Time:</b> Project Duration.	AusAID monitoring reports.  Annual PCC meetings.	AMC remains under contract to AusAID throughout the project.
<b>Output 4.2:</b> Effective contract management, and liaison with stakeholders including participating governments, AusAID, Department of Environment and Heritage.	<b>Quantity:</b> Contract and other agreements in accordance with project work programme and timeframes.  <b>Quality:</b> Six-monthly reports to be prepared in accordance with AusGuide and other quality standards.  <b>Time:</b> Six-monthly.	Six-monthly and exception reports.	
<b>Output 4.3:</b> Management of public and civil liability issues.	<b>Quantity:</b> Responsibilities clearly spelt out in all contract documents, along with documented evidence of adequate liability cover.  Emergency Response Plan.	Evidence of contractor liability cover.	Insurance cover available for this type of operation.
<b>Output 4.4:</b> Project completion report prepared, including coordination of technical inputs from SPREP.	<b>Quantity:</b> Project completion report.  <b>Quality:</b> Report to be prepared in accordance with AusGuide and other quality standards.  <b>Time:</b> Prepared and submitted within two months of project completion.	Acceptance of PCR by AusAID	All operations completed successfully

## Meeting Minutes

### PROJECT COORDINATING COMMITTEE (PCC) MEETING

Persistent Organic Pollutants (POPs) in Pacific Island Countries (PICs), Phase II –  
Scheduled POPs and Intractable Pesticide Disposal Project

AusAID Funded Initiative

1 May 2008,

SPREP Offices, Apia, Samoa

8:30 AM – 4:30 PM

Chair: Dr Frank Griffin, SPREP

## AGENDA

**8:30 REGISTRATION**

**9:00 INTRODUCTION (30 MINS)**

- ▶ Open the Meeting - Chair (SPREP)
- ▶ Outline of the aim and objectives of the meeting (SPREP/AMC\*/AusAID)
- ▶ Introduction of delegates (All)

**9:30 PROJECT SUMMARY, OUTCOMES, CHALLENGES, SUCCESSES (SPREP, AMC, 60 MINS)**

- ▶ Project Background, Introduction to POPs, Summary of Project Inception and Phase I
- ▶ Summary of Phase II, POPs in PICs Disposal Project including:
  - Phase II Project objectives including Stockholm Convention context;
  - Regional approach to project implementation;
  - 2 stage approach to cleanup, reconnaissance and cleanup
  - Export / import permitting requirements under Waigani and Basel Conventions
  - Destruction of POPs in Australia
  - Outcomes, challenges and successes
  - Questions

**10:30 MORNING TEA (15 MINS)**

**10:45 SELECTED PIC GOVERNMENT CASE STUDIES (3 PIC DELEGATES, 75 MINS)**

- Kiribati Kanton Cleanup
- PNG POPs

**12:00 LUNCH (60 MINS) - PROVIDED**

**1:00 WORKSHOP: PROJECT EVALUATION (120 MINS)**

Break away into 3 groups to discuss the following:

- ▶ **Project Effectiveness** – Discuss the positives and negatives of the implementation of the project. For example, was the overall approach effective, was communication between GHD, PICs, and SPREP effective, and was the training provided effective?
- ▶ **Project Impact and Sustainability** – Discuss the positives and negatives impacts that the Project had on the PICs. For example, what was the impact on environment, on human health, on community and governments understanding of chemical management, contribution towards Stockholm Convention requirements, promoting regional stability, and PICs relationship with Australia.
- ▶ **Project Relevance** – Discuss the appropriateness of the project scope and management approach. For example, was the objective of the Project relevant to PIC Government priorities? Was the form of Aid (i.e. cleanup and destruction focus) suitable? What were the benefits and weakness of the Australian Managing Contractor -centred management approach?

Report back findings to the larger group. AMC/SPREP to summarise and present key outcomes from the workshop.

**3:00 AFTERNOON TEA (15 MINS)**

**3:15 FITTING POPs IN PICs INTO THE BROADER CHEMICAL AGENDA (60 MINS)**

- ▶ Discuss what the priority issues regarding POPs and other hazardous chemicals management are in the PICs? (SPREP/AMC/PICs)
- ▶ Discuss National Implementation Plan (NIP) development under the Stockholm Convention
  - How has POPs in PICs helped
  - Given the POPs in PICs Project has collected most of the POPs, what are the national priorities for the next phase after NIPs?
- ▶ Present list of additional chemicals documented during the POPs in PICs Project and discuss potential management options and funding avenues (AMC/SPREP)

**4:15 CONCLUDING REMARKS (15 MINS)**

- ▶ Summary, conclusions and thanks (AMC, SPREP, PICs, AusAID)

**4:30 CLOSE MEETING**

Notes \* AMC – Australian Managing Contractor, GHD Pty Ltd

## Summary of Outcomes

The minutes document the presentation of the project background, objectives, challenges and outcomes.

The following **positive aspects** in regard to effectiveness and relevance were identified by the PIC representatives: very practical project, tangible results, good model for future, considered very successful given that there was no or very few POPs left in countries, on-the-job training was effective and useful, awareness has risen due to the project implementation, raised awareness of the Stockholm Convention and Waigani Convention processes, project was seen to have met its goals, Vanuatu stated that without this project countries could not have fulfilled obligations under the various Conventions and Vanuatu could not have ratified these Conventions without the experience and assistance through the POPs in PICs.

The following **improvements** in regard to effectiveness and relevance were identified by the PIC representatives: Pre-work and formal training sessions could have assisted capacity building, other waste management issues that need to be addressed were not included in the project scope, provision of equipment was suggested to allow ongoing management of remaining hazardous chemicals.

The minutes document a discussion on “fitting the POPs in PICs Project into the Broader Chemical Agenda”.



## **Morning Session Part 1**

1. The POPs in PICs Project Coordinating Committee (PCC) met in Apia, Samoa on 1 May, 2008 for the project's final evaluation.
2. The Meeting was attended by representatives of the following countries: Australia, Cook Islands, Federated States of Micronesia, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Republic of Marshal Islands, Republic of Palau and Vanuatu.
3. The Meeting was opened by the Secretariat of the Pacific Regional Environment Program (Here in the Secretariat) who welcomed all attendees and provided a background to the project.
4. Dr Griffin explained that work on the ground was completed in 2005 and 2006, with the exception of Vanuatu, which is expected to ship waste to Australia in 2008. Dr Griffin encouraged the attending PICs representatives to be forthcoming in providing feedback to ensure that 1) the POPs in PICs management team (Secretariat, GHD, AusAID) and 2) Australia's Department of the Environment, Water, Heritage and the Arts ('DEWHA') could maximize the assistance provided to the PICs to identify priority issues, including possibly identifying new projects to address the issues.
5. Dr Griffin presented the POPs in PICs project background and summarized the project's inception, Phases 1 and 2, including the challenges, successes and outcomes of the POPs in PICs project. The Secretariat advised that 13 Country Reports detailing the work that was undertaken as part of project inception and Phase 1 are available on the SPREP website. A table detailing the quantity of POPs that have been removed from each of the PICs was displayed and discussed. The presentation also showed the relationship between POPs in PICs and the Stockholm Convention (Articles 6 and 12).
6. Dr Griffin thanked the Government of Australia for funding the POPs in PICs project, and acknowledged GHD Pty Ltd., Hatlar Environmental Pty Ltd., HK

7. The Secretariat's presentation will be circulated to participants on CD.
8. GHD representative Mr Daniel Todd presented information on the project's original scope and practical implementation of the project, including its challenges, lessons learnt and successes, from the perspective of the Project Management Team. The presentation was intended to trigger the PICs' own experiences relating to the project, and provide them with an understanding of the decisions made during the project. GHD invited all the PCC participants to use the presentation time to make any comments and suggestions they might have. Mr Todd explained that they hoped the presentation would lead into the afternoon session, where participants would be asked to make suggestions to GHD, DEWHA and the Secretariat on the question of 'where to from here'.
9. Mr Todd noted the importance of countries ratifying the Basel & Waigani Conventions and Stockholm Convention in order to allow shipment of hazardous wastes such as POPs from the PICs to Australia, including through countries of transshipment. Mr Todd used the example of Palau, which was initially in the list of countries covered under the project but due to non-ratification of the Stockholm, Basel or Waigani Conventions, it was not possible to ship any chemicals from Palau to Australia.
10. Mr Todd reiterated that not all types of hazardous wastes were included in the scope of the POPs in PICs project, which focused on POPs that could be treated at BCD Technologies and were classified as hazardous to very hazardous. Contaminated sites, such as Bitumen in Kiribati, medical waste in Kiribati, sites suspected of having buried POPs (such as identified in FSM) and toxic gases (such as Methyl Bromide in Vanuatu) were not covered under the project. Hatlar Environmental representative, Mr Michael McCrae-Williams added that in Kiribati, where they found cylinders containing Methyl Bromide gases. After consulting with the Kiribati Montreal Protocol Officer, the team decided to execute a controlled release of the gas in a remote part of the island. This was outside the scope of the project,

11. PNG representative Katrina Solien stated that they had a similar case and had approached Orica (Orica being the original owners of these cylinders). Orica sent experts over to pack and transfer into new cylinders for shipping to Australia and paid for all the costs involved in repacking, transferring and shipping.
12. Tonga enquired about the case in Kiribati and asked if GHD had taken the ODS–Montreal Protocol into consideration when venting these toxic gases into the air given that Pacific Island Countries were Parties to the Montreal Protocol and under the ODS program, Pacific Island countries were already in the process of seeking funds to remove these toxic gases in a safe and controlled manner. Mr McCrae-Williams replied that this is true and had been considered. However in the case of Kiribati, the cylinders and their valves were corroded, which meant they might leak the toxic gases. The project team did what they considered the safest option (i.e. releasing the gas in a controlled situation) at the time.
13. GHD discussed that the project approach for Phase 2 was to have follow the Phase 1 study with a reconnaissance mission and then a clean up mission, prior to shipping the POPs to Australia for destruction GHD explained and that there were advantages and disadvantages with this approach and pointed to the case of Tonga where the team identified 15 tones of PCBs and if it hadn't been for reconnaissance, they would not have known what equipment to take along for removal purposes.
14. GHD representative Miss Katie Butler stated countries needed to be aware that wherever POPs were found and cleaned up, the area might still be contaminated with residual POPs. Wherever possible, the team attempted to clean everything up around the identified POPs sites.
15. Mr Todd suggested that if countries were looking at shipping any waste in future (e.g.: under the Waigani Convention) that they encouraged the utilization of the manifest/template of POPs drawn up by GHD for the Waigani import and export

16. GHD also made reference to the challenge created by some PICs having a long lag time between the reconnaissance mission (identifying POPs) and the cleanup work. In a couple of instances, by the time the team returned to conduct the cleanup, some materials had disappeared (e.g.: transformer in Tonga) given the value of scrap. They also pointed to communication breakdown between various national authorities (e.g.: electrical authorities and environment departments), which did not help in the cleanup and disposal effort. It was mentioned that in Yap, a ship from China was in the middle of shipping material that they had already identified as POPs. The recycling collection of disused transformers has been a concern for the project, as it has resulted in transformers being collected, shipped illegally and PCB oil disposed of in a non-environmentally sound manner.
17. Palau asked what could be done with PCB oils with less than 50 ppm PCB concentrations (i.e. that were not included under the project). Palau indicated that they have several stores of transformer oil with less than 50 ppm PCB.
18. Cook Islands asked if there had been enough awareness campaigns on this issue in country. GHD & the Secretariat responded that they had done this and that most of the activities for awareness were incorporated into consultations in drawing up NIPs. They also made reference to an awareness program conducted in Niue, which was quite successful.
19. Tonga indicated that in some cases transformers have been utilized by people as underground ovens (however there was no indication that these were PCB contaminated) and used the oil found in these transformers to mark rugby fields and netball courts. This was not the case for any for the transformer included in the POPs in PICs project, however may have occurred prior to the commencement of Phase 1. This highlighted the importance of the POPs in PICs Project in collecting these transformers, removing them from the environment so they are not used by the community for such activities.

20. GHD drew the attention of the participants to the issue of long term planning, once materials were packaged it took approximately 2 to 3 months for the paperwork to be approved before any waste could be shipped. Once the waste reached Australia, the process was quite complicated given the sensitivity of materials involved. The destruction facility could only handle about 1 to 1 1/2 tones per day.
21. The Secretariat pointed back to the initial idea of taking mobile treatment facilities around the region which had to be cancelled because of the high power required for these materials to be destroyed/burned. GHD put up examples of Certificates of Destruction or Disposal and suggested that it could be included as a good resource for inclusion in the NIPs. The Secretariat clarified that there was allowance for this type of form in the Waigani Convention under the reporting and transmission of information section but the GHD form could be annexed as well just for country information.
22. GHD touched on the initial permits and Australian Government acceptance of the project and indicated that it was a long and difficult process (approx. 2 years). In preparation for the waste to be shipped to Australia, it took a long time for community consultation given that this was the first time toxic waste was to be shipped from other countries to be destroyed in Australia.
23. Tonga asked if this was part of the EIA process and GHD responded in the affirmative saying that they had received about 30 responses from individuals and major institutions including comments from Greenpeace and others. BCD Technologies also had some stringent procedures on testing (air and water) to ensure there was no improper discharge into the surrounding environment.
24. GHD showed examples of permits from 4 different agencies in Australia that required issuing permits before any of the consignments could be shipped.
25. Mr Todd described some of the challenges faced by the team, including: weather; political unrest; non-ratification of Conventions; missing POPs after identification (perhaps better labeling and proper communication between national agencies could solve this; no proper storage facilities as in the case of Samoa and Vanuatu); logistical issues (logistics had to be robust to suit country level). GHD also stated

26. PNG asked if the new information affected the clearance of the waste. The Secretariat informed the meeting that in the case of Solomon Islands they had already packaged the chemicals so the new information didn't really have that much of an impact on the shipment of waste but if it had involved a large quantity of waste then it would certainly have had an impact on resources (human, financial & logistical).
27. In regard to missing transformers, Australia asked if there was evidence that the oil in the transformers had been drained out on site by the scrap metal dealers. GHD replied that they had discovered where transformers had been moved by the metal recyclers there had been evidence of oil on the floor. This is because the metal recyclers do not take the oil in the transformers and so have to drain it before shipping the transformers.
28. Australia suggested that perhaps it would be good for relevant countries to monitor what metal recyclers were doing as they arrived to make sure they were held responsible for the oil inside the transformers. The Secretariat clarified that this had happened in FSM and that the EPA stepped in and solved the problem before shipment left the country.
29. Australia pointed out that under the Basel Convention this was actually illegal trafficking and suggested the cooperation between environmental, policing and customs be strengthened to monitor and ensure these issues were tackled on the ground before actual shipment. Australia stressed the importance of this issue as countries would not know where the oil actually ended and that they were probably dumped in lagoons or water streams without countries' knowledge.

30. On capacity building, GHD stated that they allowed for Environmental Officers to join the chemical cleanup works. Training wasn't limited to just to environmental department personnel. GHD indicated that the training provided with aim to educate on the harmful nature of these chemicals and the practical options for cleanup.
31. Vanuatu suggested that GHD should also look at conducting follow-up trainings in a classroom-type setup. Secretariat responded that GHD usually attended national workshops conducted by SPREP through the NIPs, so they could answer questions during these workshops.
32. Samoa enquired that in relation to the e-waste project currently implemented by Samoa, asked if GHD could include it under the POPs in PICs. GHD indicated that e-waste did not fall under the scope of the project, however it may be possible to address e-waste in a new project with a similar approach. The Secretariat stated that this was an excellent point that could be brought up under the 'way forward' session.
33. GHD stated that the project worked well because of the collaborative work of GHD and SPREP (via Frank Griffin) and other major players including member country personnel. The combined teamwork was a huge contributing factor that ensured the success of the project.
34. GHD encouraged the delegate to consider their experiences with the project and put forward their examples in the next session. GHD also suggested that during the final sessions that member countries bring up top priority waste management issues in their countries and these issues would be relayed to AusAID for consideration for additional projects.
35. The presentation by GHD will be circulated to participants on CD.

## **Morning Session Part 2 – Country Presentations**

### **Kiribati (Mr. Taulehia Pulefou: Pollution Control Officer)**

36. Mr. Pulefou presented a case study on the Kiribati Kanton Cleanup and acknowledged and thanked GHD, Hatlar, SPREP for the technical assistance and the Government of Australia for funding this project as it was of vital importance to Kiribati.
37. He listed the scope of the project and outlined the approach to the cleanup.
38. The chemical shed on this island produced bad odour when wind blew in from the south and the community complained of bad headaches when near the shed. Even the corrugated iron covering the shed showed contamination.
39. 750 kg of chemicals were removed from the chemical shed. It was noted that the shed itself was still not fit for habitation. There was a worry that people would utilize these empty sheds. SPREP made an example of Fiji where they were cleaning up a shed, people were found to have moved into the facility given that it was secure and better built than their own lodgings. GHD and SPREP indicated that they had ensured the message was passed on to people on the island of Kanton to ensure they knew this was a contaminated area.
40. In addition, GHD identified over \$500,000 (estimate) value of scrap (copper, aluminum and steel) left behind on this island and that Kiribati could investigate how to turn this scrap into dollars.
41. GHD said that oil from transformers on Kanton was drained and transferred to Tarawa where they were tested. The oil showed trace levels of PCBs, but it was too low pose a significant environmental risk (<2 ppm). The oil was recycled in Tarawa.

Participants asked for clarification on packaging and structural bracing of drums within the shipping containers. Hatlar described the bracing of drums applied to all shipping containers used under the project.

42. Tonga asked if the transformer casings were removed after the cleanup on Kanton. GHD replied in the negative, as it was not possible to lift the transformers onto the ship.



43. Taulehia presented on outstanding issues after the POPs cleanup expired – issues such as pharmaceutical drugs; asbestos materials; school lab chemicals (cyanide at hosp); proper storage for e-wastes (baseline stock taking analysis is currently underway but the concern is- can they be removed?). He stated that people are already asking where to dump the e-waste and environment personnel are discouraging people from dumping them into the landfill site until they find out how they can be properly dealt with); Bitumen contaminated sites; agricultural pesticides (non POPs)- GHD could not remove pesticides that were metal-based; POPs in Banaba (formerly Ocean Island)- hazardous waste on Banaba was discovered only by chance because of a separate visit by another team for a different project; and lack of technical expertise and funding.

#### **Papua New Guinea (Ms Katrina Solien: Acting Manager, EIA)**

44. PNG provided a brief background on the progress of the development of POPs issues in PNG from the start to becoming a Party to the Stockholm Convention in October 2003. PNG and FSM were the only Pacific island countries that participated in the GEF/UNEP POPs pilot project from 2002-2006.
45. Ms Solien stated that there were a lot of problems encountered by this project. A major one was that UNEP did not have donor privileges in PNG and the project suffered through taxes. A cabinet paper was drafted but didn't quite reach the cabinet because of other extenuating factors.
46. During consultations, not all provinces were covered because of lack of funding. National workshops were held where neighbouring countries were invited (FSM) as well as a wide range of stakeholder consultations. They developed various action plans and after the review, used them as a basis in the development of the PNG NIP.
47. Some of the highlights were listed. On lack of knowledge and care about chemical disposal, she pointed to an area they couldn't cover such as other chemicals stockpiled by the PNG Defense Force. She made reference to the lack of proper

48. Ms Solien covered the major areas for which Action Plans have been developed as well as program outputs. Current waste issues in PNG were also highlighted which included PCB waste. It was noted that the survey undertaken by PNG on PCBs could only cover approximately 80% of the country.
49. Samoa asked if PNG had other management tools currently apart from other MEAs. For example in Samoa, there was a National Chemical Strategy as well as MEAs, given that they don't have a comprehensive legislation. PNG said they had enough information but PNG was trying to look at developing a national framework for POPs and other hazardous chemicals. In PNG, the law gives power to Provinces and therefore in order to have a holistic national wide policy there must be community consultations covering all of the provinces before a national framework can be drawn up. She stated that it was a huge undertaking for PNG given the amount of consultations required in order to draw up a national framework. Communication was a major issue in the development of any policy or strategy.
50. Tonga suggested that they could include consultations on the issues she mentioned in the PNG NIPs as one of their activities. PNG said that the NIP still had to go through Cabinet but even then, the NIP was just a document and required other tools to implement activities in the NIP.
51. A survey showed known documented stockpiles of over 44 tones of DDT in PNG. A similar survey by WHO actually documented more, around 63 tones of known stockpiled DDT in PNG. Ms Solien indicated that there was likely to be even more, however further survey work was required. It was found there was very low

52. Ms Solien stated that PNG's exemption to use DDT under international agreements has expired and PNG is now trying to use alternatives to teach people to use other chemicals to counter malaria. Ms Solien indicated that most of the obsolete DDT chemicals were found on the south side of the PNG, highlighting that this was an area of PNG that is closest to Australia.
53. At the completion of PNG's NIP, a letter requesting assistance was sent to the PNG Department of National Planning & Monitoring which they then used as a basis to send a request to AusAID for further assistance. They stated they were still awaiting a response from AusAID. The representative of Australia was asked if he knew what the progress of the request was and he stated that he didn't know but would bring this up in their meeting with AusAID in the coming week. PNG stated that depending on the response from AusAID, they might need to seek other sources of assistance funding.
54. The Secretariat clarified that a several countries participating in the meeting were under the GEF/PAS Program and so some of the activities identified by PNG could be covered under that program.
55. Samoa asked if PNG experienced problems in getting data from industries (e.g.: industries in Samoa not supplying data on discharge). Secretariat responded that aside from Ok Tedi there were only medium-sized companies and they do not keep any data.
56. PNG indicated that OK Tedi had arranged for transfer of PCBs on their site to Australia (40,000L of oil & some transformer casings) which Australia was in the process of approving. The shipment would go initially to BCD Technologies for pretreatment and based on the amount of PCBs identified, to another company in NSW.
57. Participants suggested PNG contact the Australian Defence Force as another avenue for assistance in removing PCBs.

### **SESSION THREE (After lunch)**

58. The Meeting broke into two groups: 1) POPs Project Impact and Sustainability and 2) POPs Project Effectiveness and Relevance with representatives reporting back on issues identified in the plenary session.

### **PLENARY SESSION**

#### **Group 1: POPs Project Effectiveness & Relevance**

##### POSITIVE

59. POPs reduced, very practical, groundwork activities, good model for future (Very successful given that there was no or very few POPs left in countries)
60. Awareness programs (before the project, POPs were not known but now a lot of countries can identify what POPs is)
61. On-the-job Training, Good to work with team, Practical and real thing (might be benefit in additional training before team arrived to cleanup as it would create the necessary linkages between relevant ministries before teams arrived)
62. Increased government understanding and now better intergovernmental communication
63. Coordinated project approach (countries found the coordinated approach as positive i.e.: through SPREP and GHD as a focal point. This was considered better than having to deal with several different players)
64. Departments worked closer together in order to remove waste
65. Helped countries become aware of obligations under international conventions: people are now familiar with the forms and process
66. Long time line an advantage
67. In line with country priorities
68. Awareness of Stockholm Convention and Waigani processes

##### IMPROVEMENTS

69. Smaller islands may not need longer time as opposed with bigger countries (long time line)
70. Pre-work and formal training sessions required
71. Other waste management issues that need to be addressed were not included in the project scope
72. Equipment needs to be provided to allow ongoing management of chemicals, along with training (when the project ends the equipment usually goes with them)

#### EFFECTIVE

73. Met its goal
74. Model could be utilized for other waste projects
75. Tonga asked that in relation between this project and the Waigani Convention, was there room for expansion for future work given that for some countries, implementing the work for POPs in PICs was actually the first time they had used the Waigani Convention to move hazardous waste abroad. The Secretariat stated that this worked started under the Stockholm Convention and later on for the trans-boundary movement of the waste it became an issue that was covered under the Waigani/Basel Conventions. This was an excellent example of using the synergistic approach to tackle the waste issue.
76. Vanuatu stated that without this project countries could not have fulfilled obligations under the various Conventions and they could not have ratified these Conventions without the experience and assistance through the POPs in PICs.

### **Group 2: Project Impact and Sustainability**

#### POSITIVES OUTCOMES

77. Very tangible results
78. Agreed there was environmental improvement in Pacific

79. Health – there were no comparative data but there is an assumption based on the removal of POPs from groundwater, soil & site contamination that health has improved
80. Removing source (still potential for impact in groundwater, soil etc.)
81. Opportunity to explore funding through universities in Australia for testing and identification of contaminated sites
82. Governments happy although some concern with time lag between recon. and actual cleanup. Need better communication on delays – both at ground level and government level
83. Laid groundwork for community awareness in POPs project and lessons learnt can be used as a model
84. Follow up on other chemicals identified
85. Developed skills & awareness to make inventories for SAICM easier
86. Lots of information gained to use in future programs
87. Community awareness good but room for improvement
88. Educate children as priority

#### NEGATIVE

89. Montreal Protocol requirements (Admitted that there should have been closer collaboration with the Montreal Protocol)
90. GHD website to inform PICs never got off the ground
91. Need money for ongoing monitoring and testing
92. Lessons learnt need to be shared between countries (e.g.: mosquito coils on Niue where they didn't declare DDT on the packaging, but upon testing found DDT in product. These were then included in the project cleanup)
93. Still need plans in country to manage future chemicals identified (Policy dept., Financial assistance available, Practical procedure knowledge)

94. Program done before POPs NIPs developed
95. Opportunity to certify & train staff in country to handle, manage, clean up chemicals
96. Issue of POPs being identified now that project nearing completion (but this is not the end of the commitment)
97. Identified pesticides have been put in garbage and found in landfill (related to building good storage facilities in countries)
98. Some buried POPs collected but there are still some left

## **SESSION FOUR**

### **Fitting POPs in PICs into the Broader Chemical Agenda**

99. The Secretariat presented the revised 2009-2010 work program for the Waigani Convention to show the participants areas of possible linkages in light of the STAC 2 and PRC Meeting outcome results.

### **FLOOR DISCUSSIONS**

100. Query: GHD queried whether Activity 1 (development of frameworks and legislations) was going to be handled on a regional or nation-by-nation level and of the hazardous problems identified, which one was the highest priority in country. Members responded that all on the list were identified as priorities, including:

- Non-POPs such as school lab chemicals, industrial chemicals, and organics with metal content that could not be included in the Project
- ULABs
- Lead acid batteries
- e-waste
- Medical waste, such as infectious waste

- Pharmaceuticals
- Solid waste management issues, such as landfills and waste collection

The question was posed on what assistance was required –

101. Query: Would the POPs in PICs approach be best suited to solve these problems? AusAID had asked what other issues could be tackled under POPs in PICs bearing in mind the best use of resources.
102. Answer: For ULABS, some countries were already doing something about it through the country by country approach (e.g.: Cook Islands is working on shipping to NZ, Vanuatu is in the process of shipping to Australia, RMI is also processing their material through to Australia) but e-waste can be looked at using the POPs in PICs model/approach.
103. PNG: There is a huge pharmaceuticals problem in PNG but the health dept were burning them.
104. Hatlar: stated that all incinerators seen on island were not suitable for burning pharmaceuticals. Hatlar also mentioned that they were very worried about thermometers being destroyed in these incinerators as the mercury contained within them was highly dangerous. These and other chemicals (school chemicals) could best be treated using the regional (i.e.: POPs in PICs) approach.
105. GHD: Suggested community awareness and school awareness as some of the issues that came up discussions.
106. KBR : Countries should look at the threat - which was biggest in terms of volume or health risk.
107. Samoa stated that they were looking at conducting inventories of unknown or obsolete chemicals and were looking at including NGOs, and other relevant stakeholders to try and gather as much information as possible. They were also trying to build capacity of environmental personnel in order for them to train



108. She also said there were also unknown hot spots as well as the ones identified in the previous POPs in PICs and inventory of unknown sites and the need for rehabilitation were other issues of priority. Another issue for Samoa was the need to set up a centralized database to collect the data.
109. Secretariat pointed to the SAICM meeting, which identified priorities on legislation, capacity building, development of infrastructure and gathering of data as an avenue for which Samoa's concerns could be addressed.
110. Secretariat (Mark Ricketts) stated that the POPs in PICs project was very focused on the high risk issues and focused on the "go in & get it out" approach. In this respect the project was very successful. Unfortunately most of the other suggestions as listed on the list of priority issues were going to be much harder (e.g.: data, legislation, institutional strengthening) and in terms of AusAID using the POPs in PICs model, we also have to look at how they see it as a success. He said that what POPs in PICs lacked was the ongoing system of management and that the glaring next phase would be for people to be trained (especially Agricultural Department personnel on what to buy and what not to). While the POPs and PICs was a good model for POPs chemicals, he didn't see the model could be easily applied to other chemicals which are less well defined - but rather to build on the model with an 'ongoing funding and management' if applied to other chemicals or wastes. He suggested looking at building in of taxes as a way of getting income to perhaps fund some on the ongoing in-country activities.
111. Secretariat stated that the need for legislation and frameworks were already outlined in NIPs but there were no legislations to back up implementation. He said there could be so many problems happening in country but there is also no commitment in country to keep the sustainability of the project.
112. GHD: Suggested that Customs Department needed to be strengthened to stop more POPs coming in. Secretariat stated that because of the lack of legislations, customs has limited power.

113. UNEP (Keneti): Asked that if the issue of legislation and frameworks cut across environment areas, then what's stopping countries implementing change right now without any outside intervention, i.e. putting legislations in place? What are the issues that are stopping countries from putting legislations in place?
114. PNG: PNG has 19 provinces and the law gives a lot of power in provinces. To develop legislations they have to collect information and consultations must be wide spread to cover ALL stakeholders (NGOs, industries, public etc.), which would be a very costly exercise.
115. Samoa: Various Government ministries have their own legislations and whatever is put forward for enforcement on the environmental side, other ministries come up with their own issues. For example, Health says they had their own legislation to deal with their own waste and Environment has no say in it. For example, the medical waste incinerator is under the health legislation so Environment cannot say anything about it.
116. Solomons: Similar to PNG in terms of conducting national consultations. However, a unique issue to SI is that whilst government realizes waste is an important issue, when the crunch comes (i.e.: to actually put money into activities/projects) – government chooses other issues as priority for funding, not waste. This is where outside intervention is needed.
117. PNG: There were also other sectors/agencies that manage other chemicals so to develop a comprehensive legislation they would also have to review or check other sectors legislation to ensure all chemicals were covered under the one legislation.
118. GHD: Mentioned Vanuatu's case where legislation was not strong enough to issue a fine and they contacted the Australian government and asked for assistance to develop Vanuatu framework.
119. Australia: All government legislations were available freely off the website and anecdotally countries such as Singapore, Malaysia have copied their regulations and modified it slightly for their own jurisdictions. They've found industries that have mentioned that regulations utilized by these countries were exactly the same as

120. PNG: There are also political issues. People below them have to be informed enough to convince the politicians and this is all related to the consultative process which again PNG has mentioned as a very costly and time consuming exercise.
121. Secretariat: Unless you have a package that includes community consultations etc, legislation by itself is just another piece of paper.
122. Australia: Supported the point by Secretariat and stressed the importance of having legislations that deal with hazardous waste that can link in with a Customs Act.
123. Kiribati: Legislations have impacts on the traditional way of living. People are not used to practicing what is in the legislations. When environment department asks them to stop rubbishing, people ask the environment department to come and get the rubbish off them because they were not used to not rubbishing. It's an exercise of changing attitudes and having the proper legislations to back it up.
124. Secretariat said that if they were piloting a project for medical waste, e-waste, asbestos, etc. the same approach as the POPs in PICs Project could be applied, however to ensure sustainability of the outcomes, the issues identified by countries in regard to legislative short-falls have to be addressed too. It will take time but flexibility must be allowed in order for island people to become used to the issues identified.
125. Australia: Pointed to the discussions over the past 3 days– if there is a priority that was a common issue, then that could be tackled as a regional issue in a new project but saw the 'rolling over activities' approach as perhaps not so practical. He stated that during the meetings, he did not hear the delegates as a whole clearly highlight any particular issues, for example that batteries were a major priority in the region and needed to be removed. It also seemed like different countries have different needs and different timelines for them to be implemented.

126. GHD : GHD would like to see sustainability of the project outcomes, and in terms of POPs sustainability, what we are hearing is that 1) legislations need to come in 2) capacity building of countries to manage and understand POPs in the future is required.
127. Vanuatu: Indicated that one components to be considered under sustaining the outcomes of the project should be to ensure any further POPs identified subsequent to the POPs in PICs Project can be included in a future project. Vanuatu stated that as clearly shown in the GHD presentation, given ample time, more POPs are likely to be found. It is likely that there are still things worth removing out there. Vanuatu also noted that they were unclear on what to do about the site that had been cleared, but still remain contaminated / uninhabitable.
128. UNEP: Stated that they are seeing the need for a more coordinated overall program on the management of waste as a way of ensuring a longer-term approach. As a way forward, we have to look across the board in building capacity in handling all wastes under different conventions. He talked about the GEF PAS, including 3 programs relating to POPs and hazardous waste including: 1) Monitoring program that builds capacity of labs to monitor chemicals (to be done by USP); 2) DDT alternatives (Micronesian countries only); and 3) Integrated Management of Solid Waste, Hazardous Waste and POPs. He also mentioned that countries had to identify priorities in the development of the program and hoped that the POPs in PICs team would be involved in the process.
129. GEF PAS identified only 8 countries in the Integrated Management of Solid and Hazardous Wastes and POPs. \$3.5 Mil would be available for this component of the GEF PAS. He also pointed to the AFD and that UNEP were already meeting EU in Paris on linkages between all these different programs. He acknowledged the group exercise and the resulting text (see Group Presentation session) as the best way to address the gaps in the way forward.
130. Secretariat : These projects required co-financing and instead of it putting countries off that they look at using AusAID commitment to the region for the co-financing

131. Tonga stated that they had already submitted a paper for the GEF PAS and wondered if that had been approved. UNEP confirmed the approval of GEF PAS and only 4 PIFs were acknowledged to have gone under the GEF PAS. All other PIFs were still under development. \$3.5 Mil was capped in relation to the number of countries and they were currently seeking co-financing to cover other countries.
132. Secretariat asked for clarification in developing PIFs, was there to be one PIF that covered everything or each country was required to do a PIF. UNEP indicated that multiple countries would be under one PIF, but the worry was that national issues would be lost if there's going to be a regional PIF.
133. UNEP: This goes back to the discussion on what is regional and what is national priority and countries in designing programs should be very wary of that. National priorities should not be lost and UNEP has taken this on board, therefore hidden in the title is "implementing the NIPs".
134. UNEP: Projects are still counted and activities are dependent on what countries say are priorities. Project activities will be implemented on the ground even though the PIF may appear regional.
135. UNEP: In the POPs monitoring program, there are national priorities and activities but they also have to acknowledge that equipment and capacity are not in existence in country. This is where regional expertise will be required so national priorities are not diluted but effectiveness of using resources will be through the use of synergistic approaches.
136. GHD asked UNEP if the countries present that were not on the GEF PAS list could be included under the UNEP program. UNEP stated that when this was developed, these were the only countries that highlighted waste as a priority and therefore countries who were not listed, did not bring up waste as a priority. POPs is not subject to the RAF – so it is not an allocation specifically per country. Secretariat responded that the work program had been drawn up by an outside team.

137. Samoa asked under POP monitoring activities how the \$517,000 would be allocated.

138. UNEP: Indicative figure of 1 million was put up last year and countries had to come up with priorities that fit into that. Countries came up with 120 million worth of priorities. So there has been a collective effort of different donors to meet this amount (e.g.: UNEP GEF PAS, PAC). He also clarified that NIP implementation for Cook Islands was not \$517,000, that the amount would be dispersed amongst the 6 countries listed for activities relating to POPs monitoring. Between now and October they have to work on the PIFs with other relevant stakeholders and SPREP technical officers are available to countries to develop country proposals to ensure priorities are addressed. Meanwhile for the longer term, countries should start thinking about GEF 5 given that GEF 4, is all accounted for.

139. UNEP addressed PNG query reminding that there are other programs that UNEP wanted to work with to ensure there was integrated approach to solid waste.

Solomons: What does AusAID want in terms of what happens after POPs in PICS? Solomons indicated that the countries need to focus on the non-POPs chemicals and health care and components on capacity building and legislative frameworks. He stated that countries had clearly indicated the need for another project (similar to POPs in PICs) to focus on these particular issues, as there was still existing stockpiles in countries.

GHD: POPs in PICs has been a successful project in its practical approach. From what we are hearing, any future project model may need to be accompanied with legislative reform and a larger capacity building component. With a practical goal in mind, which must be put forward by the PICs, we can work together to tackle all these issues identified.

Secretariat stressed the importance of capacity building (e.g.: in the case of incinerator) as a huge issue in country. So operation, maintenance and ongoing funding is a factor that needs to be included in any future project.

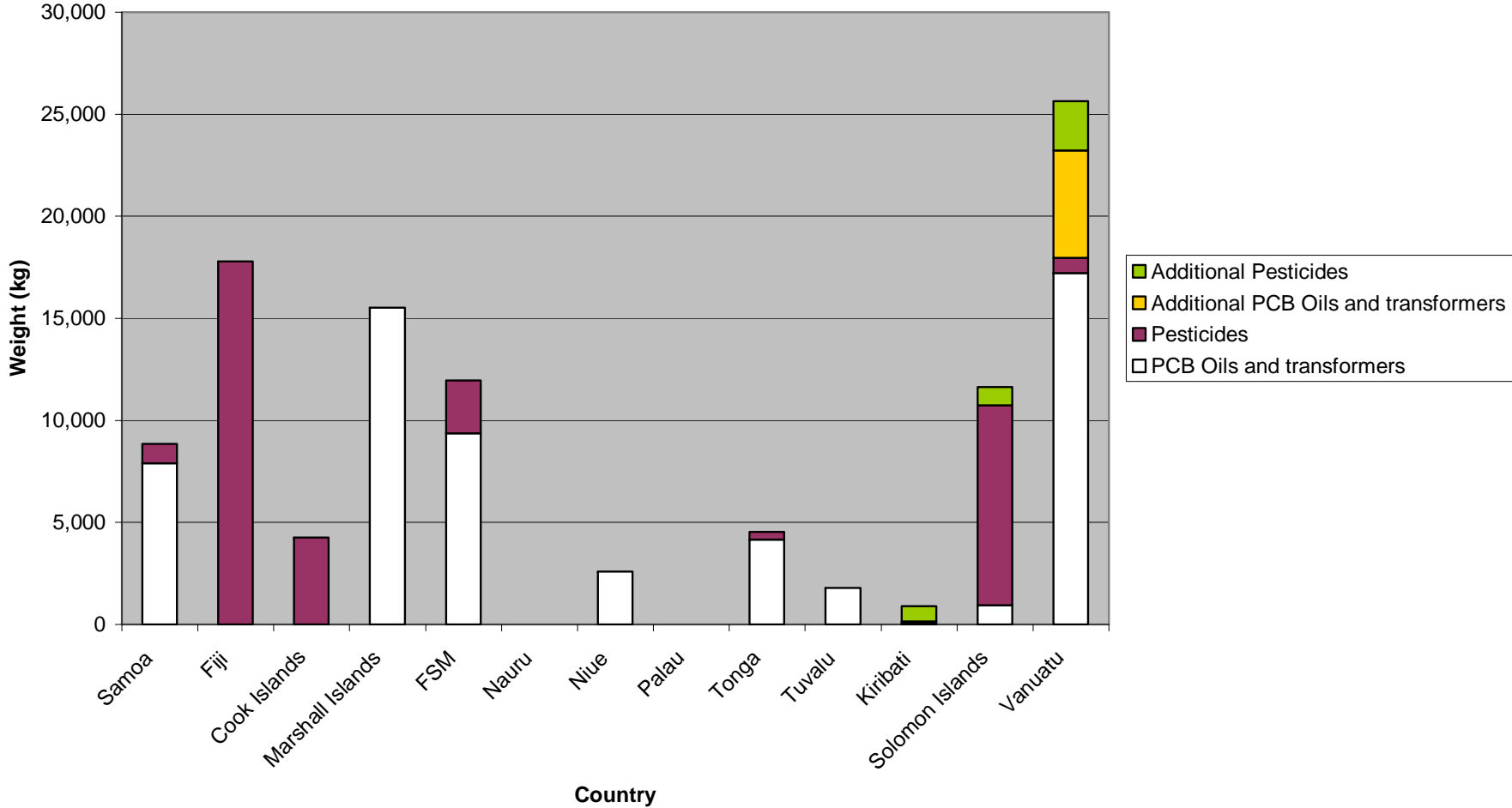
140. Australia stressed that outside of the GEF & AusAID process, that through other MEAs there are opportunities for countries to access other resources.

## **CLOSING SESSION**

141. GHD thanked the participants for their inputs and discussion and handed over to Dr Griffin for closing.
142. Secretariat thanked all the participants, AusAID the Australian Government and the POPs Team for a successful project. It was indicated that the presentations and additional information from the session would be included on a CD and distributed to all on the participant list.
143. The Secretariat announced SAICM for Samoa (USD250,000) had been approved and they only have to show co-financing before the project kicks off. He also suggested that for those countries who don't have SAICM focal point to identify focal points and contact SPREP to assist in putting up countries proposals and sending to SAICM QSP for assistance.

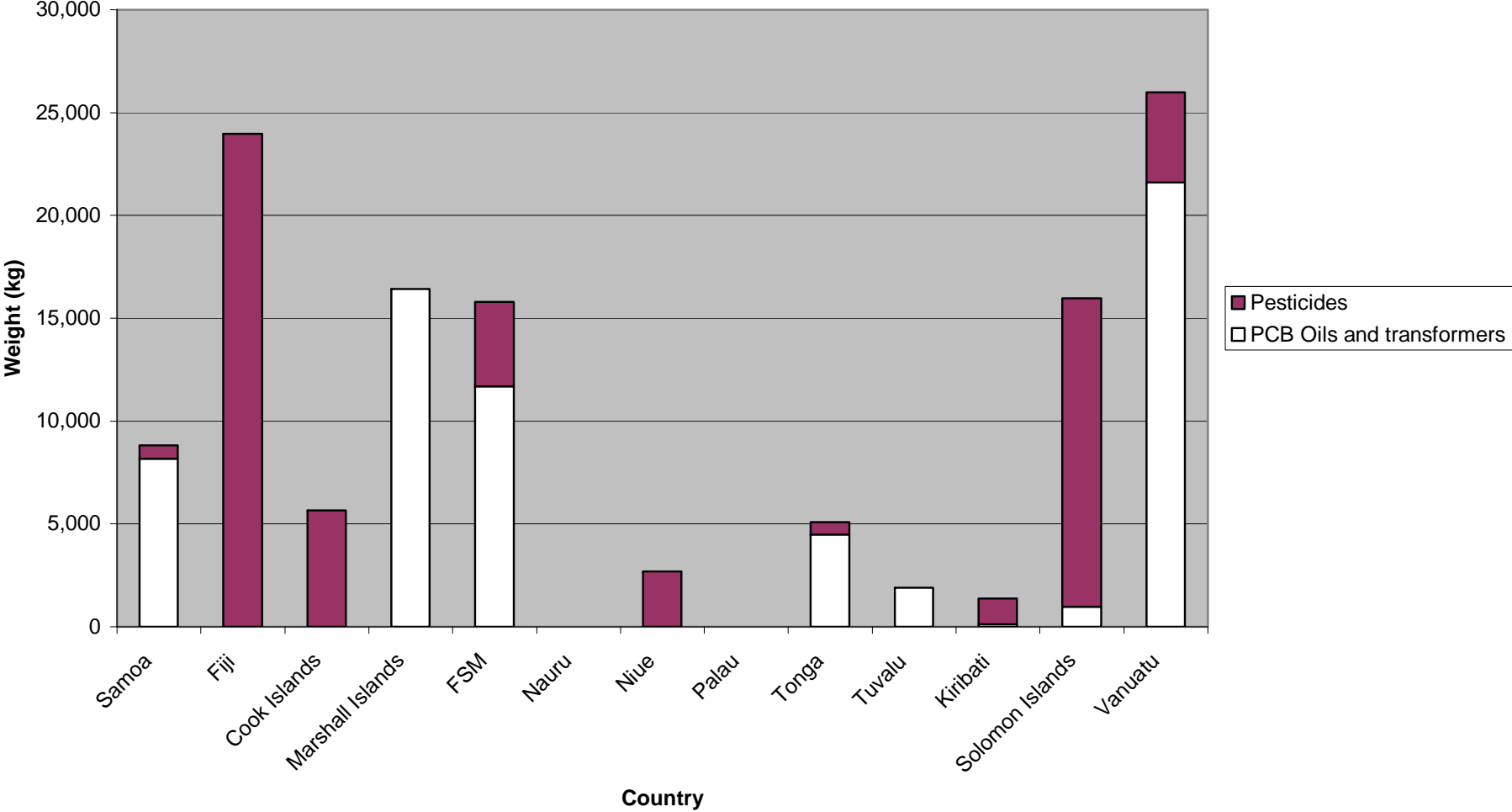
ANNEX 3c: POPS DESTRUCTION SUMMARY

Final Manifests with Additional POPs Identified

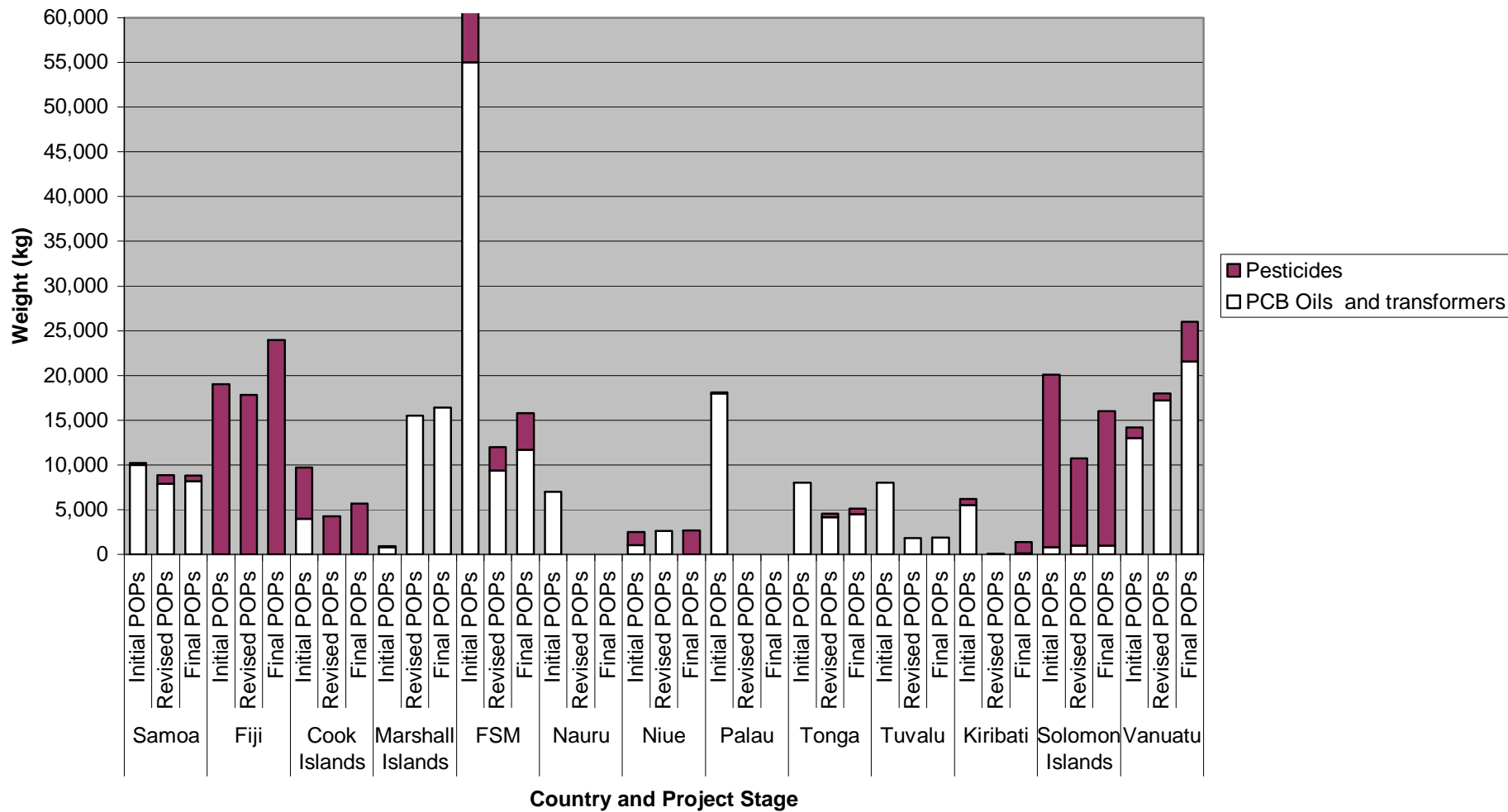




### Final Quantity of POPs Collected by Country



### POPs Quantity by Country and Project Stage



## POPs in PICs

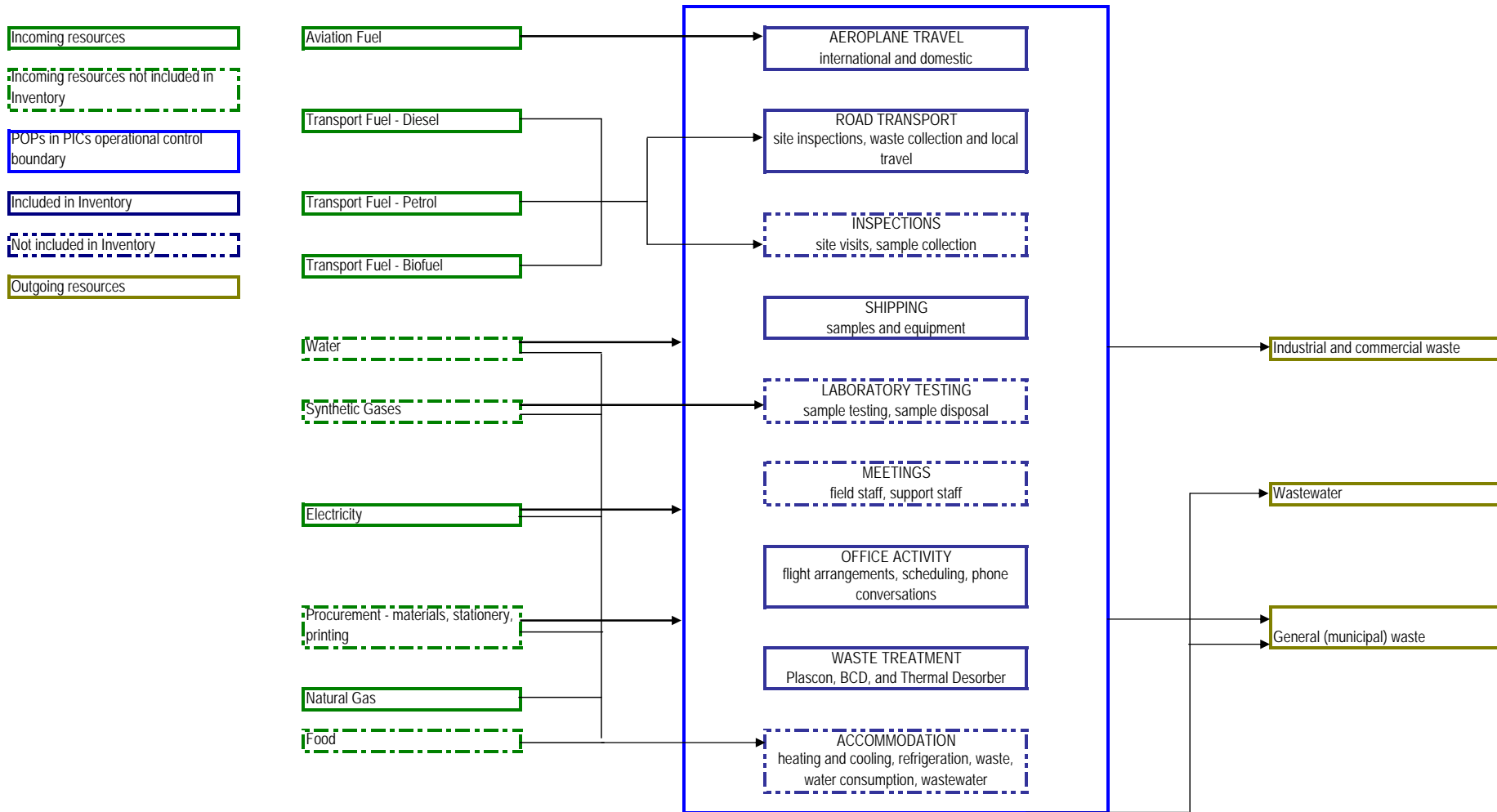
### Greenhouse Gas Inventory

#### Project Life Cycle Inventory Purpose

<b>Purpose</b>	<p>This spreadsheet is an inventory of the greenhouse gas emissions generated by the POPs in PICs project throughout its duration.</p> <p>The spreadsheet was developed to provide an understanding of the life-cycle emissions of greenhouse gases associated with the POPs in PICs project to provide AusAid with an indication of the cost to offset emissions over its life cycle.</p>
<b>Format</b>	<p>The spreadsheet contains:</p> <ol style="list-style-type: none"><li>1. A visual outline of the inventory boundary, showing what is included in and excluded from the inventory;</li><li>2. A tab showing the activity data and greenhouse gas emissions for each activity associated with the project (air travel, shipping, road transport, office emissions, waste treatment), and</li><li>3. The summary of the greenhouse gas emissions for each activity and an indicative cost associated with offsetting emissions.</li></ol>

POPs in PICs

Greenhouse Gas Inventory  
Project Life Cycle Inventory Boundary



POPs in PICs

Reconnaissance and Clean-Up

Aeroplane Travel - Flight Emissions

Activity	Source	Quantity	Units	Emissions Factor per km(t CO2-e/one-way trip)	Total Emissions (t CO2-e)
Aeroplane Travel	Aviation Fuel and others	1,017,586	passenger-km	0.000149572	152
<b>Total</b>					<b>152</b>

Notes:

- Travel includes both local (within Australia) and international flights. These also include both chartered and commercial flights.
- Emissions factor used was the weighted average of emissions per flight kilometre using the Qantas emissions calculator found at <http://www.qantas.com.au/travelcontent/dyn/carbonCalculator>
- Travel distances determined through the Climate Friendly emissions calculator, found in <https://climatefriendly.com/flight>
- Flight information for the reconnaissance and clean-up activities obtained from Travel Diaries and Monthly Reports for the project.
- Flight information for "Other Flights" based on an estimate that 4 flights to Brisbane and 6 to Canberra were undertaken for each year of the project.
- Majority of the air travel occurred during the reconnaissance and clean-up activities, thus aeroplane travel accounted for in this inventory were those occurring from 2003-2006.

Date	Depart from	Country	Arrive in	Country	Distance (km)	Total team no.s	Total person-kms
<b>Stage 1</b>							
9-Aug-03	Melbourne	Australia	Auckland	New Zealand	2643	3	7,929
	Auckland	New Zealand	Apia	Samoa	2882	5	14,410
11-Aug-03	Apia	Samoa	Asau	Samoa	144	5	720
14-Aug-03	Apia	Samoa	Nadi	Fiji	1210	5	6,050
15-Aug-03	Nadi	Fiji	Suva	Fiji	122	5	610
	Suva	Fiji	Labasa	Fiji	194	5	970
18-Aug-03	Labasa	Fiji	Suva	Fiji	194	5	970
21-Aug-03	Nadi	Fiji	Port Villa	Vanuatu	967	5	4,835
23-Aug-03	Port Villa	Vanuatu	Tanna	Vanuatu	224	5	1,120
	Tanna	Vanuatu	Port Villa	Vanuatu	224	5	1,120
24-Aug-03	Port Villa	Vanuatu	Luganville	Vanuatu	270	5	1,350
26-Aug-03	Luganville	Vanuatu	Port Villa	Vanuatu	270	5	1,350
28-Aug-03	Port Villa	Vanuatu	Nadi	Fiji	967	5	4,835
29-Aug-03	Nadi	Fiji	Auckland	New Zealand	2158	5	10,790
	Auckland	New Zealand	Rarotonga	Cook Islands	3013	5	15,065
	Rarotonga	Cook Islands	Aitutaki	Cook Islands	261	5	1,305
	Aitutaki	Cook Islands	Rarotonga	Cook Islands	261	5	1,305
30-Aug-03	Rarotonga	Cook Islands	Mangaia	Cook Islands	209	5	1,045
	Mangaia	Cook Islands	Rarotonga	Cook Islands	209	5	1,045
1-Sep-03	Rarotonga	Cook Islands	Atiu	Cook Islands	219	5	1,095
	Atiu	Cook Islands	Rarotonga	Cook Islands	219	5	1,095
4-Sep-03	Rarotonga	Cook Islands	Auckland	New Zealand	3013	3	9,039
5-Sep-03	Auckland	New Zealand	Melbourne	Australia	2643	3	7,929
<b>Stage 2</b>							
14-Sep-03	Melbourne	Australia	Cairns	Australia	2303	5	11,515
15-Sep-03	Cairns	Australia	Agana	Guam	3378	5	16,890
	Agana	Guam	Majuro	Marshall Islands	2979	5	14,895
18-Sep-03	Majuro	Marshall Islands	Agana	Guam	2979	5	14,895
	Agana	Guam	Koror	Palau	1311	5	6,555
21-Sep-03	Koror	Palau	Yap	FSM	454	5	2,270
24-Sep-03	Yap	FSM	Agana	Guam	856	5	4,280
26-Sep-03	Agana	Guam	Chuuk	FSM	1019	5	5,095
28-Sep-03	Chuuk	FSM	Pohnpei	FSM	706	5	3,530
1-Oct-03	Pohnpei	FSM	Kosrae	FSM	600	5	3,000
2-Oct-03	Kosrae	FSM	Agana	Guam	1800	5	9,000
	Agana	Guam	Cairns	Australia	3378	5	16,890
3-Oct-03	Cairns	Australia	Brisbane	Australia	1393	5	6,965
	Brisbane	Australia	Melbourne	Australia	1379	5	6,895
<b>Stage 3</b>							
5-Oct-03	Cairns	Australia	Brisbane	Australia	1393	5	6,965
6-Oct-03	Brisbane	Australia	Nauru	Nauru	3332	5	16,660
	Nauru	Nauru	Tarawa	Kiribati	723	5	3,615
7-Oct-03	Tarawa	Kiribati	Nauru	Nauru	723	5	3,615
9-Oct-03	Nauru	Nauru	Nadi	Fiji	2232	5	11,160
11-Oct-03	Nadi	Fiji	Auckland	New Zealand	4316	5	21,580
	Auckland	New Zealand	Hanan	Niue	2482	5	12,410
13-Oct-03	Hanan	Niue	Sydney	Australia	4176	5	20,880
15-Oct-03	Sydney	Australia	Nuku Alofa	Tonga	3587	5	17,935
17-Oct-03	Nuku Alofa	Tonga	Suva	Fiji	748	5	3,740
20-Oct-03	Suva/Nausori	Fiji	Funafuti	Tuvalu	1054	5	5,270
23-Oct-03	Funafuti	Tuvalu	Suva/Nausori	Fiji	1054	5	5,270
24-Oct-03	Suva/Nausori	Fiji	Nadi	Fiji	122	5	610
25-Oct-03	Nadi	Fiji	Sydney	Australia	3167	5	15,835
	Sydney	Australia	Melbourne	Australia	705	5	3,525
<b>Stage 4</b>							
19-Jun-04	Melbourne	Australia	Auckland	New Zealand	2643	4	10,572
	Auckland	NZ	Apia	Samoa	2882	4	11,528
28-Jun-04	Apia	Samoa	Sydney	Australia	4326	4	17,304
29-Jun-04	Sydney	Australia	Melbourne	Australia	705	4	2,820
7-Aug-04	Melbourne	Australia	Nadi	Fiji	3867	4	15,468
8-Aug-04	Nadi	Fiji	Suva	Fiji	122	4	488
	Suva	Fiji	Labasa	Fiji	194	4	776

Date	Depart from	Country	Arrive in	Country	Distance (km)	Total team no.s	Total person-kms
15-Aug-04	Labasa	Fiji	Suva	Fiji	194	4	776
21-Aug-04	Suva	Fiji	Nadi	Fiji	122	4	488
23-Aug-04	Nadi	Fiji	Suva	Fiji	122	4	488
	Suva	Fiji	Naku Alofa	Tonga	748	4	2,992
28-Aug-04	Tongatapu	Tonga	Auckland	New Zealand	2004	4	8,016
	Auckland	New Zealand	Sydney	Australia	2160	4	8,640
29-Aug-04	Sydney	Australia	Nadi	Fiji	3167	4	12,668
	Nadi	Fiji	Suva	Fiji	122	4	488
30-Aug-04	Suva	Fiji	Funafuti	Tuvalu	1054	4	4,216
2-Sep-04	Tuvalu	Tuvalu	Suva	Fiji	1054	4	4,216
	Suva	Fiji	Nadi	Fiji	122	4	488
4-Sep-04	Nadi	Fiji	Brisbane	Australia	2716	4	10,864
	Brisbane	Australia	Port Vila	Vanuatu	3796	4	15,184
12-Sep-04	Port Vila	Vanuatu	Sydney	Australia	2483	4	9,932
19-Sep-04	Melbourne	Australia	Nauru	Nauru	4707	4	18,828
21-Sep-04	Nauru	Nauru	Brisbane	Australia	3332	4	13,328
23-Sep-04	Brisbane	Australia	Cairns	Australia	1393	4	5,572
24-Sep-04	Cairns	Australia	Guam	Guam	5285	4	21,140
	Guam	Guam	Kosrae	FSM	1800	4	7,200
27-Sep-04	Kosrae	FSM	Majuro	Marshall Islands	1200	4	4,800
30-Sep-04	Majuro	Marshall Islands	Agana	Guam	2979	4	11,916
1-Oct-04	Agana	Guam	Pohnpei	FSM	1636	4	6,544
4-Oct-04	Pohnpei	FSM	Agana	Guam	1636	4	6,544
	Agana	Guam	Chuuk	FSM	1019	4	4,076
7-Oct-04	Truk	FSM	Agana	Guam	1019	4	4,076
	Agana	Guam	Yap	FSM	856	4	3,424
10-Oct-04	Yap	FSM	Agana	Guam	856	4	3,424
	Guam	Guam	Brisbane	Australia	4635	4	18,540
25-Oct-04	Melbourne	Aust	Auckland	NZ	2643	4	10,572
	Auckland	NZ	Rarotonga	Cook Is	3013	4	12,052
4-Nov-04	Rarotonga	Cook Islands	Auckland	New Zealand	3013	4	12,052
5-Nov-04	Auckland	New Zealand	Niue	Niue	2488	4	9,952
12-Nov-04	Niue	Niue	Apia	Samoa	626	4	2,504
13-Nov-04	Apia	Samoa	Auckland	New Zealand	2882	4	11,528
15-Nov-04	Auckland	New Zealand	Melbourne	Australia	2643	4	10,572
<b>Stage 5</b>							
18-Jan-05	Melbourne	Australia	Suva	Fiji	3934	4	15,736
22-Jan-05	Suva	Fiji	Melbourne	Australia	3934	4	15,736
	Pohnpei	FSM	Wellington	New Zealand	5632	2	11,264
2-Mar-05	Suva	Fiji	Wellington	New Zealand	2615	2	5,230
	Tarawa	Kiribati	Wellington	New Zealand	4571	2	9,142
	Majuro	Marshall Islands	Wellington	New Zealand	5394	2	10,788
	Niue	Niue	Wellington	New Zealand	2866	2	5,732
	Port Moresby	Papua New Guinea	Wellington	New Zealand	4459	2	8,918
	Apia	Samoa	Wellington	New Zealand	3316	6	19,896
	Naku'Alofa	Tonga	Wellington	New Zealand	2425	6	14,550
	Funafuti	Tuvalu	Wellington	New Zealand	3673	2	7,346
	Port Vila	Vanuatu	Wellington	New Zealand	2700	2	5,400
	Auckland	New Zealand	Wellington	New Zealand	480	2	960
7-Mar-05	Melb	Aust	Port Vila	Vanuatu	1898	4	7,592
8-Mar-05	Port Vila	Vanuatu	Espirito Santo	Vanuatu	269	2	538
11-Mar-05	Santo	Vanuatu	Tanna	Vanuatu	200	2	400
12-Mar-05	Tanna	Vanuatu	Port Vila	Vanuatu	224	2	448
17-Mar-05	Port Vila	Aust	Melb	Aust	3187	1	3,187
19-Mar-05	Port Vila	Vanuatu	Brisbane	Vanuatu / Aust	3796	3	11,388
2-Apr-05	Melbourne	Australia	Auckland	New Zealand	2643	3	7,929
	Auckland	New Zealand	Niue	Niue	2482	3	7,446
7-Apr-05	Niue	Niue	Auckland	New Zealand	2482	3	7,446
	Auckland	New Zealand	Melbourne	Australia	2643	3	7,929
10-Apr-05	Melb	Aust	Nadi	Fiji	3867	2	7,734
	Nadi	Fiji	Suva	Fiji	122	2	244
11-Apr-05	Suva	Fiji	Funafuti	Tuvalu	1054	2	2,108
14-Apr-05	Funufuti	Tuvalu	Suva	Fiji	1054	2	2,108
15-Apr-05	Suva	Fiji	Nadi	Fiji	122	2	244
	Nadi	Fiji	Melbourne	Aust	3867	2	7,734
17-Apr-05	Brisbane	Aust	Nauru	Nauru	3332	2	6,664
20-Apr-05	Nauru	Nauru	Tarawa	Kiribati	723	2	1,446
20-Apr-05	Brisbane	Aust	Nauru	Nauru	3332	1	3,332
	Nauru	Nauru	Tarawa	Kiribati	723	1	723
23-Apr-05	Tarawa	Kiribati	Nauru	Nauru	723	3	2,169
	Nauru	Nauru	Brisbane	Aust	3332	3	9,996
<b>Other Flights (Domestic)</b>							
2002	Melbourne	Australia	Brisbane	Australia	1379	4	5,516
	Brisbane	Australia	Melbourne	Australia	1379	4	5,516
	Melbourne	Australia	Canberra	Australia	469	6	2,814
	Canberra	Australia	Melbourne	Australia	469	6	2,814
2003	Melbourne	Australia	Brisbane	Australia	1379	4	5,516
	Brisbane	Australia	Melbourne	Australia	1379	4	5,516
	Melbourne	Australia	Canberra	Australia	469	6	2,814
	Canberra	Australia	Melbourne	Australia	469	6	2,814
2004	Melbourne	Australia	Brisbane	Australia	1379	4	5,516
	Brisbane	Australia	Melbourne	Australia	1379	4	5,516
	Melbourne	Australia	Canberra	Australia	469	6	2,814

Date	Depart from	Country	Arrive in	Country	Distance (km)	Total team no.s	Total person-kms
	Canberra	Australia	Melbourne	Australia	469	6	2,814
2005	Melbourne	Australia	Brisbane	Australia	1379	4	5,516
	Brisbane	Australia	Melbourne	Australia	1379	4	5,516
	Melbourne	Australia	Canberra	Australia	469	6	2,814
2006	Canberra	Australia	Melbourne	Australia	469	6	2,814
	Melbourne	Australia	Brisbane	Australia	1379	4	5,516
	Brisbane	Australia	Melbourne	Australia	1379	4	5,516
	Melbourne	Australia	Canberra	Australia	469	6	2,814
	Canberra	Australia	Melbourne	Australia	469	6	2,814
						<b>Total Distance</b>	<b>1,017,586</b>

Departure	Arrival	Flight Distance	Emissions per flight (Qantas)	EF per kilometre
Melbourne	Sydney	705	0.1	0.000141844
Melbourne	Brisbane	1379	0.149	0.000108049
Melbourne	Auckland	2643	0.231	8.74007E-05
Melbourne	Cairns	2303	0.235	0.000102041
Melbourne	Nadi	3867	0.588	0.000152056
Melbourne	Nauru	4707		
Melbourne	Port Vila	3187		
Melbourne	Canberra	469	0.093	0.000198294
Sydney	Apia	4323		
Sydney	Nadi	3167	0.484	0.000152826
Sydney	Hanan (Niue)	4176		
Sydney	Naku Alofa, Tonga	3587		
Cairns	Agana, Guam	3378		
Cairns	Brisbane	1393	0.13	9.33238E-05
Brisbane	Nadi	2716	0.416	0.000153166
Brisbane	Port Vila	1898	0.294	0.0001549
Brisbane	Honiara	2115		
Brisbane	Noumea	1450	0.303	0.000208966
Brisbane	Tarawa (Kiribati)	3833		
Brisbane	Agana, Guam	4635		
Brisbane	Nauru	3332		
Auckland	Hanan (Niue)	2482		
Auckland	Apia	2882		
Auckland	Rarotonga	3013		
Auckland	Sydney	2160	0.182	8.42593E-05
Auckland	Naku Alofa, Tonga	2004		
Nadi, Fiji	Apia	1210		
Nadi, Fiji	Suva	122	0.031	0.000254098
Nadi, Fiji	Port Vila	967	0.156	0.000161324
Nadi, Fiji	Auckland	2158	0.437	0.000202502
Nadi, Fiji	Nauru	1341		
Suva, Fiji	Labasa, Fiji	194		
Suva, Fiji	Naku Alofa, Tonga	748		
Suva, Fiji	Funafuti, Tuvalu	1054		
Agana, Guam	Majuro, MI	2979		
Agana, Guam	Koror, Palau	1311		
Agana, Guam	Chuuk, FSM	1019		
Agana, Guam	Yap, FSM	856		
Agana, Guam	Pohnpei, FSM	1636		
Port Vila, Vanuatu	Tanna	224		
Port Vila, Vanuatu	Santo (luganville)	269	0.036	0.000133829
Port Vila, Vanuatu	Sydney	2483	0.382	0.000153846
Rarotonga, CI	Aitutaki, CI	261		
Rarotonga, CI	Mangala, CI	209		
Rarotonga, CI	Aitu, CI	219		
Koror, Palau	Yap, FSM	454		
Chuuk, FSM	Pohnpei, FSM	706		
Inu (Nauru)	Tarawa (Kiribati)	723		
Inu (Nauru)	Nadi	2232		
Apia	Asau	144		
			Average (All)	0.000150
			Average (Australia)	0.000129
			Average (Pacific)	0.000158

## POPs in PICs

## Shipment of Containers

## HK Logistics

Activity	Source	Quantity	Units	Emissions Factor (t CO2-e/ tonne-km)	Total Emissions (t CO2-e)
Container Shipping	Transport Fuel	904,616	tonne-km	0.00001236	11
<b>Total</b>					<b>11</b>

## Notes:

- Travel distances are estimates only, primarily determined by using the Port World distance calculator found in <http://www.portworld.com/map/>.
- Emissions factor used was based on the average of emissions per tonne-km across 1991 through 2005 as presented in Table 15 of the Australian Government document *Analysis of Recent Trends and Greenhouse Indicators 1990 to 2005*, prepared by the Department of the Environment and Water Resources and published in 2007
- Shipping distance is usually measured in nautical miles, which is equivalent to approximately 1.852 km. The quantity was therefore determined by accounting for the distance travelled in km and the total tonnage shipped for the duration of the project.
- Weight of shipping container was accounted for in the inventory. It was assumed that 20' containers were used having a tare mass (mass when empty) of 2.4 tonnes. For every shipment, the weight of the container was added.

Transit Route	Distance 1 (nautical miles)	Distance 2 (nautical miles)	Distance 3 (nautical miles)	Distance 4 (nautical miles)	Distance 5 (nautical miles)	Distance TOTAL
Apia (Samoa), Suva (Fiji), Brisbane (Aus)	630	1,511				2,141
Suva (Fiji), Brisbane (Aus)	1,511					1,511
Rarotonga (CI), Apia (Samoa), Suva (Fiji), Brisbane (Aus)	1,221	630	1,511			3,362
Majuro (MI), Santo (Vanuatu), Port Vila (Vanuatu), Melbourne (Aus), Sydney (Aus), Brisbane (Aus)	1,404	152	1,832	512	419	4,319
Yap (FSM), Pohnpei (FSM)	1,224					1,224
Chuuk (FSM), Pohnpei (FSM)	389					389
Kosrae (FSM), Pohnpei (FSM)	297					297
Pohnpei (FSM), Honiara (Sol Islands), Brisbane (Aus)	1,009	1,158				2,167
Niue (Niue), Auckland (NZ), Sydney (Aus), Brisbane (Aus)	1,340	1,185	419			2,944
Nakualofa (Tonga), Lautoka (Fiji), Suva (Fiji), Brisbane (Aus)	500	99	1,511			2,110
Funafuti (Tuvalu), Auckland (NZ), Brisbane (Aus)	1,764	1,248				3,012
Kanton, Tarawa (Kiribati)	953					953
Tarawa (Kiribati), Majuro (MI), Port Vila (Vanuatu), Brisbane (Aus)	360	1,496	1,028			2,884
Honiara (Sol Islands), Brisbane (Aus)	1,158					1,158
Port Vila (Vanuatu), Napier (NZ), Nelson (NZ), Brisbane (Aus)	1,452	248	1,310			3,010

Origin	Tonnes Waste	Number of containers used	Additional container weight	Total tonnage for shipment	Distance Travelled (km)	Activity Data (tonne-km)
Samoa (Apia)	8.8	1	2.4	11	3,965	44,461
Fiji (Suva)	24.0	10	24	48	2,798	134,213
Cook Islands (Rarotonga)	5.7	2	4.8	10	6,226	65,135
Marshall Islands (Majuro)	16.4	2	4.8	21	7,999	169,654
Federated States of Micronesia (15,789)						
Yap	1.4	1	2.4	4	2,267	8,675
Chuuk	10.5	1	2.4	13	720	9,316
Kosrae	1.4	1	2.4	4	550	2,079
Pohnpei	2.5	1	2.4	25	4,013	101,893
Niue (Niue)	2.7	1	2.4	5	5,452	27,742
Tonga (Nakualofa)	5.1	1	2.4	7	3,908	29,265
Tuvalu (Funafuti)	1.9	1	2.4	4	5,578	23,964
Kanton	0.84	0	0	1	1,765	1,474
Kiribati (Tarawa)	1.37	1	2.4	4	5,341	20,136
Solomon Islands (Honiara)	16.0	4	9.6	26	2,145	54,866
Vanuatu (Port Vila)	26.0	5	12	38	5,575	211,743
	123.64				<b>Activity data:</b>	<b>904,616</b>



**GHD**

**POPs in PICs**

**Road Transport**

Activity	Sub-category	User	Quantity	Units	Quantity	Units	Fuel Consumption Rates (L/km)	Scope 1 EF (t CO2-e/kL)	Scope 3 EF (t CO2-e/kL)	S1 Emissions (t CO2-e)	S3 Emissions (t CO2-e)	Total Emissions (t CO2-e)
Trucking of Waste (Port of Brisbane to Narangba)	Transport Fuel - Diesel	Container Truck	32	containers	50	tonne-km	0.546	2.698	0.205	2	0	3
In Country Vehicular Travel	Transport Fuel - Petrol	Cars	94	inspection days	50	km	0.115	2.380	0.181	1	0	1
<b>Total</b>										<b>4</b>	<b>0</b>	<b>4</b>

**Notes:**

1. For trucking, it was assumed that travel distance from Port of Brisbane to Narangba Industrial is 50km. It was further assumed that B-Double trucks were used which carried two containers per trip and no
2. For in country vehicular travel, it was assumed that 50km was covered for each day of inspection on site. Note that this is an estimate and is not based on any actual data. In country vehicular travel only
3. Fuel consumption rates were obtained from the Report: Survey of Motor Vehicle Use, Australian Bureau of Statistics (2008), Summary Table 1 in L/km
4. Emissions factors were obtained from the National Greenhouse Accounts Factors, Department of Climate Change (June 2009). NGA data was converted to tonCO2-e/kL by multiplying the Total Emission

## GHD

### POPs in PICs

#### Preliminary Estimate of Greenhouse Gas Emissions

#### Office-Related Emissions

Hours spent on project less time In Country	Quantity (years)	Emission Factor (t CO2-e/unit)	Total Emissions (t CO2-e)	Percentage
Total hours GHD staff input to the main project	3.9	3.3	13	82%
Communications Strategy time input	0.8	3.3	3	18%
<b>Total</b>			<b>16</b>	<b>100%</b>

#### Notes:

GHD Emissions obtained from GHD's Feasibility Study Report for the Greenhouse Friendly Program dated 2005.

#### GHD Emissions - Melbourne

Activity	No Of Staff (FTE)	Per Capita Emissions (tCO2-e/person/yr)
Metered Electricity Use	390	2.5
Business Travel in Personal Vehicles	390	0.6
Business Travel in GHG Vehicles	390	0.2
		<b>3.3</b>

## POPs in PICs

### Treatment of POPs

#### BCD Technologies

Activity	Source	Quantity	Units	Emission Factor (t CO2-e/unit)	Total Emissions (t CO2-e)
Waste Treatment	Energy use at BCD Technologies	123.64	tonne	0.98	121
Waste Treatment	CO2 production from Plascon plant	11.344	tonne	3.14	36
<b>Total</b>					<b>156</b>

Activity	Source	Quantity	Unit	EF (tCO2-e/unit)	Total Emissions (tCO2-e)
Energy use at BCD Technologies	Electricity	619658.84	kWh	0.00104	644
	Natural Gas	620	GJ	0.0573	36
	Waste	43.2	tonne	1.66	72
Total Emissions for Site					752
Total Waste Treated per Year					770
<b>Operational Emission Factor per tonne waste destroyed (tCO2-e/t waste)</b>					<b>0.98</b>

#### Assumptions:

PCB concentration: 1500 mg PCB/kg transformer oil

PCB to CO2 equivalent: 1 mol PCB --> 12 mol CO2

Average molecular weight (MW) of PCB: 375.7 g/mol (based on Aroclor 1260, a common PCB congener, found in [www.epa.gov/ttn/atw/hlthef/polychlo.html](http://www.epa.gov/ttn/atw/hlthef/polychlo.html))

MW of CO2: 44 g/mol

Hydrocarbon concentration: 998.5 g hydrocarbon/kg transformer oil

Ratio of CO2 to hydrocarbon: 3.14286 g CO2/ g hydrocarbon

#### PCB to CO2 Emissions Factor (EF PCB)

Amount CO2 produced = tonnes of transformer oil X PCB concentration / molecular weight of PCB X mols of CO2 produced per mol of PCB destroyed X molecular weight of CO2

*E.g.* t CO2 -e/t TO = [(1000kg TO)\*(1.5g PCB/kg TO)/(375.7g/mol PCB)\*(12 mol CO2/mol PCB)\*(44g/molCO2)]/1000000

*t CO2 -e/t TO = 0.002108*

#### Hydrocarbon to CO2 Emissions Factor (EF HC)

Amount CO2 produced = tonnes of transformer oil X hydrocarbon concentration / molecular weight of hydrocarbon X mols of CO2 produced per mol of hydrocarbon destroyed X molecular weight of CO2

$$\begin{aligned}
 \text{E.g. } t \text{ CO}_2\text{-e/t TO} &= [(1000\text{kg TO}) \times (998.5\text{g C}_{16}\text{H}_{32}/\text{kg TO}) \times (1/224 \text{ g/mol C}_{16}\text{H}_{32}) \times (16 \text{ mol CO}_2/\text{mol C}_{16}\text{H}_{32}) \times (44\text{g/mol CO}_2)]/1000000 \\
 &= [(1000\text{kg TO}) \times (998.5\text{g C}_{16}\text{H}_{32}/\text{kg TO}) \times (3.14286)]/1000000 \\
 t \text{ CO}_2\text{-e/t TO} &= 3.138143
 \end{aligned}$$

**EF for waste treated through Plascon**

Emission Factor = EF PCB (PCB to CO2 EF) + EF HC (Hydrocarbon to CO2 EF)

Emission Factor = 0.002108 + 3.138143 = 3.140251

**Notes:**

1. Electricity, natural gas, and waste values obtained from Krissy Sanders of BCD Technologies through e-mail correspondence dated 26 August 2008, as found in the document BCD Technologies Greenhouse Gas Emissions.
2. Total amount of waste treated at BCD Technologies per annum estimated at 770 tonnes, also provided by Krissy Sanders of BCD Technologies through e-mail correspondence dated 26 August 2008, as found in the document BCD Technologies Greenhouse Gas Emissions..
3. The emissions factor for plant operations was determined by dividing the estimated total annual operational emissions of BCD by the total estimated amount of waste treated per annum.
4. The emissions factor for CO2 production through the destruction of transformer oil containing PCB through the Plascon plant was estimated by determining the stoichiometric balance between the amount of transformer oil (containing naphthenic mineral oil and a small fraction of PCB) destroyed and the amount of CO2 produced in the Plascon process.  
 Destruction in the Plascon plant being an oxidative process, all the C atoms in the waste being destroyed is thereby converted into CO2. PCB contains 12 C atoms in its structure, producing 12 mols of CO2 during oxidation. Transformer oil is composed primarily of naphthenic mineral oil, which is a cycloalkane, containing C and H atoms.  
 The ratio of the amount of CO2 produced in relation to the molecular weight of the cycloalkane is 3.1428. That is, if the hydrocarbon in the transformer oil is C16H32, the mols of CO2 produced (16) multiplied by its molecular weight (44 g/mol), divided by the molecular weight of C16H32 is 3.1428.
5. It was assumed that the transformer oil was only composed of primarily naphthenic hydrocarbons, whilst the rest is polychlorinated biphenyl (PCB). It was further assumed that the PCB concentration in the transformer oil is 1500mg/kg, as this is the threshold that qualifies the transformer oil for treatment by the Plascon plant.

## POPs in PICs

### Greenhouse Gas Emissions Estimate

Activity	Source	Quantity	Units	Total Emissions (t CO2-e)	Percentage	Offset Cost Estimate (\$)
Aeroplane Travel	Transport Fuel - Aviation fuel and Ground Operations	1,017,586	passenger-km	152	45%	7,671
Waste Treatment	Energy use at BCD Technologies	123.6442	tonne	121	36%	6,083
Waste Treatment	CO2 production from Plascon plant	11.344	tonne	36	11%	1,795
Shipping	Transport Fuel	904,616	tonne-km	11	3%	564
Office Emissions	Energy and Fuel Use	5	years	16	5%	783
Road Transport - Trucking	Transport Fuel - Diesel	1,600	tonne-km	3	1%	131
Road Transport - Vehicular travel	Transport Fuel - Petrol	4,700	km	1	0%	70
<b>Total</b>				<b>339</b>	<b>100%</b>	<b>17,097</b>

## POPs in PICs

### Preliminary Estimate of Greenhouse Gas Emissions

Activity	Source	Quantity	Units	Fuel Consumption Rates	Total Emissions Factor (t CO <sub>2</sub> -e/unit)	Total Emissions (t CO <sub>2</sub> -e)	Percentage
Aeroplane Travel	Transport Fuel - Aviation fuel and Ground	1,017,586	passenger-km		0.0	152	45%
Waste Treatment	Energy use at BCD Technologies	123.6442	tonne		1.0	121	36%
Waste Treatment	CO <sub>2</sub> production from Plascon plant	11.344	tonne		3.1	36	11%
Shipping	Transport Fuel	904,616	tonne-km		0.0	11	3%
Office Emissions	Energy and Fuel Use	5	years		3.3	16	5%
Road Transport - Trucking	Transport Fuel - Diesel	1,600	tonne-km	0.542	3.0	3	1%
Road Transport - Vehicular travel	Transport Fuel - Petrol	4,700	km	0.107	2.8	1	0%
<b>Total</b>						<b>339</b>	<b>100%</b>

**Notes:**

- This inventory is expected to provide an estimate of the likely emissions produced by the various activities associated with the project to date.
- Greenhouse gas emissions associated with the following activities were not included in the inventory due to lack of information:
  - Embodied emissions in materials and/or consumables used.
  - Emissions associated with on-site inspection activities.
  - Laboratory testing emissions.
  - Emissions associated with meetings and other office activities relating to POPs in PICs activities, including fuel combustion emissions from local vehicular travel during these meetings.
  - Emissions associated with accommodations.
- Offset cost estimate based on an average of the projected 2008 and 2009 prices of Renewable Energy Certificates as modelled by the Clean Energy Council in the Sustainable Energy Update of January 2008. The offset costs will be strongly affected by the final design of the Carbon Pollution Reduction Scheme, with the White Paper due to be released by the end of 2008.

**In context:**

One Australian home for one year: 14 tCO<sub>2</sub>e  
 One Australian car for one year: 4.5 tCO<sub>2</sub>e  
 One Australian for one year: 24 tCO<sub>2</sub>e  
 (these figs taken from Bendigo Bank Generation Green website, stated source Vic & fed govt)

14	homes
75	cars
14	Australians

## ANNEX 4: PROJECT MANAGEMENT REPORTS

Project Management Reports		
PM002:	Emergency Response Guidelines	July 2003
PM003:	Risk Management Plan	July 2003
PM004:	Field Operations Procedures	July 2003
PM005:	Project Procedures Manual	March 2004
PM006:	2004-2005 Annual Plan	May 2004
PM007:	Six Monthly Report – Period March 2004 to November 2004	January 2005
PM008:	Six Monthly Report – Period December 2004 to June 2005	August 2005
PM009:	2005-2006 Annual Report	December 2006
PM010:	Import Permits for First Six PICs	September 2006
PM011:	Cleanup Report for the First Six PICs	January 2007
PM012:	Cleanup Report for Remaining Six PICs	March 2007
PM013:	Import Permits for Final PICs	August 2008
PM014:	Transport and Logistics Report	March 2009
PM015:	Disposal of Shipped Chemicals Report	August 2009
PM016	Project Completion Report	September 2010
PM017	2006-2007 Annual Report	December 2007
PM018	2007-2008 Annual Report	July 2009
Project Reports		
PR001:	Permitting Schedule Report	October 2003
PR002:	Six Monthly Report	January 2004
PR004:	Chemical Assessment Plan and Manifest	March 2004
PR005:	Transport/Logistics Plan	March 2004
PR006:	Clean Up Plan	June 2004
PR007:	BCD Technologies Trade Waste Non Compliance Incident Notification and Investigation Procedure	July 2007
PR008:	BCD Technologies Trade Waste Non Compliance Report	November 2008
Project Exception Reports		
2005	January, February, March, April, May, June, July, August, September, October, November and December	
2006	January, February, March, April, May, June and July	
2007	1 <sup>st</sup> Quarter (Jan, Feb, Mar) 2 <sup>nd</sup> Quarter (Apr, May, Jun) and July	
2008	February, March, 2 <sup>nd</sup> Quarter (Apr, May, Jun), 3 <sup>rd</sup> Quarter (July, Aug, Sept)	