POPS IN PICS

Independent Completion Report

Prepared for:

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Revision History

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Abbreviations

AusAID	Australian Agency for International Development
ACR	Activity Completion Report
AMC	Australian Managing Contractor
AQIS	Agricultural Quarantine Inspection Service (Federal Government)
DAFF	Department of Agriculture, Fisheries and Forests (Federal Government)
DEWHA	Department of Environment, Water, Heritage and the Arts (Federal Government)
DDT	Dichloro Diphenyl Trichloroethane
EIRR	economic internal rate of return
ENPV	economic net present value
GEF	Global Environment Facility
GOA	Government of Australia
ICR	Independent Complete Report
NGO	non-government organisation
PCB	PolyChlorinated Biphenyls
PCC	Project Coordination Committee
PDD	Project Design Document
PICs	Pacific Island countries
PNG	Papua New Guinea
POPs	persistent organic pollutants
QEPA	Queensland Environment Protection Authority
SPREP	South Pacific Regional Environment Program/Secretariat of the Pacific Regional Environment Programme (alternatively known as PROE – Programme régional océanien de l'environnement)
UNEP	United Nations Environment Program
UNDP	United Nations Development Program
WWF	World Wildlife Fund

Definitions

Basel Convention	The Basel Convention for the 'Control of Trans-boundary Movements of Hazardous Waste and their Disposal' formalised in 1989, is a global treaty to minimise and eventually eliminate the generation of and subsequent movement of hazardous wastes between nations.
Dioxins and Furans	Dioxins and furans are the respective common names for polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). These two groups of compounds are highly toxic, bioaccumulative and are scheduled wastes under the Stockholm Convention. They are formed as by-products of incineration of chlorinated organic compounds at temperatures below 1,200°C and also as unintended by-products in the bleaching of wood pulp in the manufacture of paper, in the manufacture of organochloride chemicals including pesticides and naturally by forest fires and volcanoes.
DEWHA	The Australian Federal Government agency whose responsibilities include ensuring compliance with the Basel and Waigani Conventions and the administration and regulation of the EPBC Act.
Intractable pesticides	In the context of this project, compounds covered in this group are those stockpiled pesticides (see below for POPs) that can be treated in Australia at the Narangba destruction facility operated by BCD.
Persistent Organic Pollutants (POPs)	POPs are toxic synthetic organic chemicals that are persistent and bio-accumulative. They have the potential to adversely affect human health causing cancers, birth defects, interference with immune and reproductive systems and comparable or greater damage to environmental systems
Stockholm Convention	The Stockholm Convention on POPs is an international legally binding agreement, effective from May 2004 whose objective is to protect human health and the environment from POPs. Currently almost 160 countries, including Australia, are signatories to the Convention and its conditions of agreement. Twelve scheduled POPs are listed in an annex to the Convention and comprise: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, toxaphene, HCBs, PCBs, dioxins and furans.
Waigani Convention	The Waigani Convention is a regional agreement declared to ban the importation into signatory countries of unregulated hazardous and radioactive wastes and to control the trans-boundary movements and management of hazardous wastes within the South Pacific Region. Declared in 1995, this international and legally binding agreement also aims to minimise production within the region and to ensure the environmentally sound management and disposal of already existing waste.

1 General information

1.1 BACKGROUND

This Independent Completion Report (ICR) reviews the Phase II of an AusAID funded project to manage persistent organic pollutants (POPs) in Pacific Island countries (PICs). The long-term objective of the POPs in PICs Project is to increase regional capacity for management of hazardous chemicals.

The program started following a request from the South Pacific Regional Environment Program (SPREP) for the Government of Australia (GOA) to assist island nations in the cleanup of hazardous wastes associated with expanding economic development in the region. SPREP is based in Apia in Samoa.

Thirteen SPREP member countries took part in the project evaluation stage (Phase I) but only 12 took part in Phase II as Palau failed to ratify the Waigani Convention. Ratification of this international agreement was critical requirement in ensuring correct procedures for regional movement of wastes into Australia for disposal.

The 12 countries were:

- Cook Islands
- Federated States of Micronesia (FSM)
- Fiji
- Kiribati
- Marshall Islands
- Nauru
- Niue
- Samoa
- Solomon Islands
- Tonga
- Tuvalu
- Vanuatu

All are small, geographically diverse island states ranging from high islands usually of volcanic origin, low elevated coral platform islands to coral atolls. Most are densely populated and all lack any of the specialised resources needed for collection, treatment and safe disposal of persistent hazardous chemicals. The geographic spread of these countries is illustrated in Figure 1.1.

Phases II has been completed and a Draft Activity Completion Report submitted by the AMC.

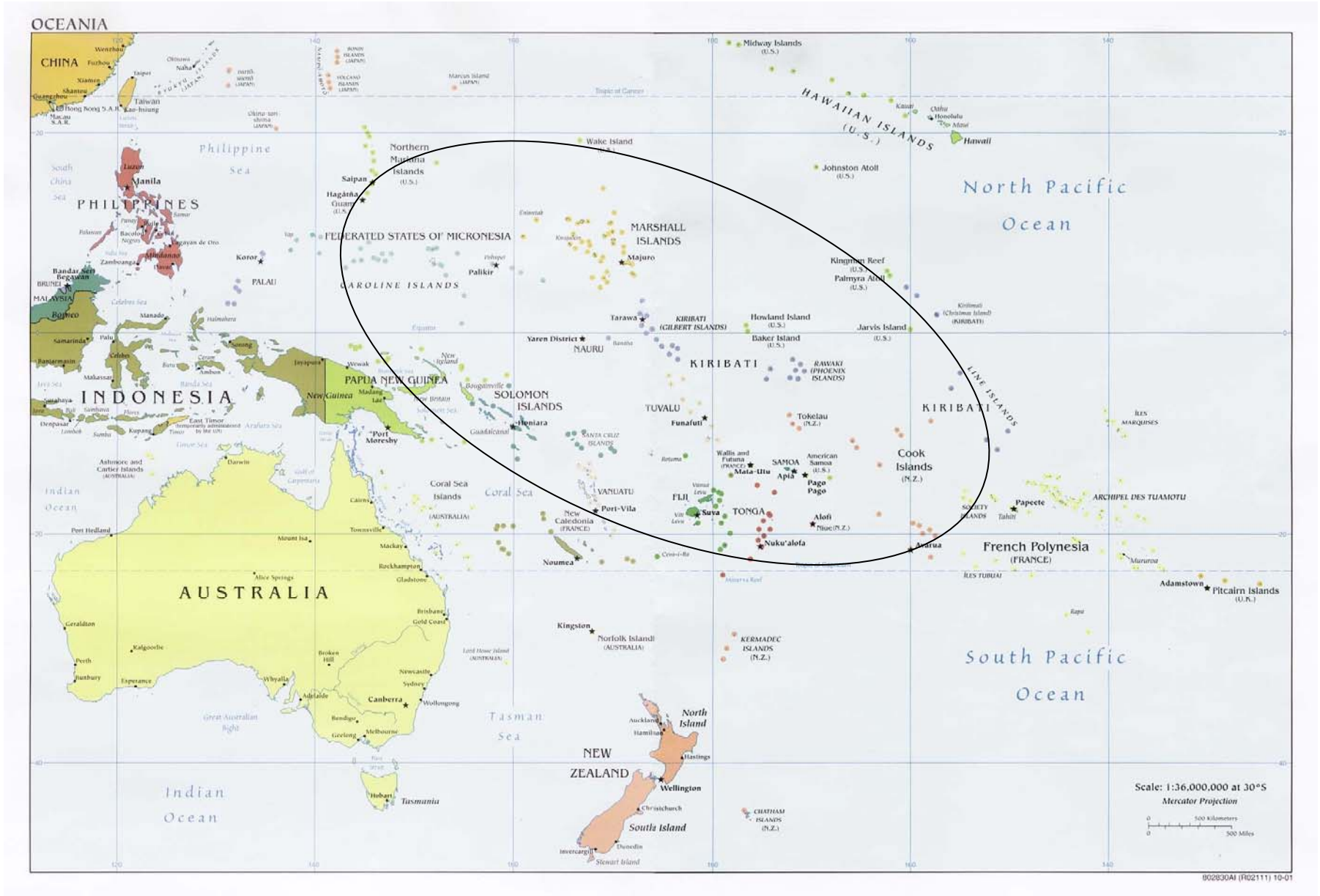

Figure 1.1
PACIFIC ISLAND COUNTRIES TAKING PART IN THE POPS PROGRAM (AFTER GHD 2008)

1.2 THE PROBLEM

POPs comprise a range of synthetic organic chemicals formerly in widespread use in the community. Twelve of the most persistent are now banned and are listed on schedules attached to the Stockholm Convention and its regional equivalent, the Waigani Convention.

Listed chemicals are the pesticides aldrin, chlordane, Dichloro Diphenyl Trichloroethane (DDT), dieldrin, endrin, heptachlor, hexachlorobenzene, mirex and toxaphene plus PolyChlorinated Biphenyls (PCBs), dioxins and furans.

Exposure to POPs results in liver damage, some cancers, nervous system damage (with impacts on learning and intelligence), endocrine disruption and/or interference with hormone functions.

Most POPs are fat soluble thus of particular concern to women whose body fat reserves are mobilised during pregnancy and breast-feeding. This facilitates the transference of POPs to infants at an early and particularly vulnerable stage of their life.

The effects of POPs on wildlife are similar to those observed in humans and form an ongoing threat to a wide spectrum of animal species (including beneficial insects) as well as humans.

Prior to the program, there was negligible awareness of the problems posed by POPs nor the benefits of a POPs clean-up and removal project. This reflected the long term, difficult-to-detect effects of the problem[1].

Intractable pesticides of most concern are moderately to highly persistent. Others do degrade (albeit at varying rates) under moist tropical conditions typical of the South Pacific islands.

These matters, the scope of the problem and recommended solutions were discussed in detail in Burns et al (2000).

1.3 THE ROLE OF AUSAID

Pacific island nations have neither the fiscal capacity nor technology to destroy or even safely dispose of intractable pesticides particularly those of most concern. In contrast, Australia has the capacity to define the problem, plan and execute the solution and effectively destroy the contaminants using accepted World Best Standard Practice for this group of hazardous wastes.

The ability to supply these skills in an effective manner complemented AusAID's strategy and policies for the Pacific region. Phase I of the project clearly demonstrated the high likelihood of success and the enhanced benefits to human health and environmental protection. This ICR is concerned with Phase II, the AusAID supported program undertaking this cleanup process.

The overall program supports activities of Partner Governments in sectors supported by Australia and other major donors to the region.

[1] World Wildlife Fund 1999

1.4 THE PHASE II PROJECT

1.4.1 Project goal

The goal of the Phase II POPs in PICs project was to:

> 'reduce the threat posted by Persistent Organic Pollutants and related chemicals toward the environment and human health in PICs'.

1.4.2 Project objectives and purpose

The objectives and purpose of the Phase II project was to[2]:

> 'dispose of Polychlorinated biphenyls (PCBs) and PCB containing compounds including 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 participated PICs'.

1.4.3 Project values

Phase II was a practical demonstration of how to remove and destroy the most hazardous POPs. This procedure eliminated threats to human health and the environment in PICs from these substances.

This activity included training by example involved personnel from National agencies to assist them find practical solutions to management of other hazardous wastes rather than merely defining problems It also reinforced the necessity for transparency, quality assurance and strict compliance with international treaties for the removal and shipment of toxic waste.

1.4.4 Project limitations

The technology used by BCD Technologies (the operator of POPs destruction facility) at Narangba near Brisbane was only for destruction of scheduled POPs, consequently a wide range of hazardous wastes are still present in the region.

Other types of hazardous waste require different disposal methods, such as incineration, but these alternative processes are currently located outside the Australasian region.

1.4.5 Project management

AusAID appointed GHD as the Australian Managing Contractor (AMC) and lead consultant. GHD were supported by the Hatlar Group (POPs cleanup specialists), HK Logistics (logistical support for personnel, materials and wastes) and BCD Technologies.

[2] Draft Project Completion Report

1.4.6 Project timing

Phase II commenced in April 2003 with the appointment of GHD. The community stakeholder program and other activities (project actions and logistics planning, risk management in remote island locations) culminated in submission to AusAID of the Project Procedures Manual in August 2003. Reconnaissance visits commenced in August 2003 and removal of POPs from 12 island nations began in June 2004.

For a range of reasons the final shipment and destruction of POPs waste was completed in April 2009. The Draft Project Completion Report was submitted in mid October 2008.

2 Relevance of the ICR program

2.1 GOAL

The goal of this ICR evaluation is to improve AusAID's policy analysis and the design and implementation of AusAID's activities by the identification and adoption of lessons learned from POPs in PICs' project activities.

2.2 OBJECTIVES

The objectives of this evaluation are to assess the relevance, efficiency, effectiveness, impact and sustainability of the program undertaken by the AMC and to draw out lessons learned.

This ICR reviews achievements of the Phase II program by comparing achievements described in the Draft Activity Completion Report (ACR) against the observations made during this ICR program. It was noted that the Phase II program design reflected lessons learned from Phase I activities.

2.3 COVERAGE

Visits were made by the ICR team to counterparts in three representative island nations: Samoa, the Cook Islands and the Solomon Islands. Further information was gathered through interviews with stakeholders within Australia from all levels of government and the community (Federal, State and Local Governments, business and local residents).

From these inputs, the ICR team (refer to Appendix B) compiled the following sections of the report following the Evaluation Report format as per Attachment B of AusGuideline 5.2.

3 Program efficiency and effectiveness

3.1 TIMELINESS AND APPROPRIATENESS OF PROGRAM EXECUTION

Table 3.1 Timeliness and appropriateness of program execution.

Factor	Issue	Strategy/Outcome
Waste types and waste volumes – need to update and refine Phase I data.	Some waste quantities were underestimated, others were no longer present.	Better planning of materials, manpower and logistics achieved though an initial reconnaissance.
Remote locations and limited capacity of client nations.	Need to adjust to changes in the project program with minimal delays.	Robust and simple waste collection methods and close control over all shipping activities.
Potential for delays in project controlled activities.	Quality control of project activities.	Accommodated changes to schedules by strategic planning.
Uncontrolled factors encountered	• Unscheduled changes to inter-island shipping schedules. • Tropical cyclones and prolonged adverse weather. • Delays by some PIC governments in signing of transhipment documentation • Political unrest.	Overcome through good communications strategy and robust project methodology.

Overall assessment

- The program was generally undertaken in a timely manner.
- Delays in returning to remove assessed POPs from some locations affected the overall efficiency of project activities.
- Project demonstrated an appropriate level of technology, very professional management of all logistical steps and appropriate levels of skills for the tasks encountered.

3.2 PARTNER GOVERNMENT SUPPORT

Table 3.2 Partner government support

Factor	Issue	Strategy/Outcome
Facilitation of access and cooperation in different PICs.	Local agencies had minimal experience of issues involved.	Support from SPREP brought in local knowledge of contacts and customs at each PIC.
Security of packed wastes.	Lack of understanding by local agencies of the critical need for security of containerised waste.	Overcome by mentoring of local agency staff by AMC plus detailed briefing and practical training by AMC and SPREP.

Overall assessment

- Discussions with representatives of agencies in the three PICs by the ICR team confirmed all agencies highly valued the assistance given, the outcomes achieved, the professionalism of the Phase II project personnel and their willingness to share expertise.
- Partner government support was hampered by the lack of physical resources and availability of sufficiently qualified personnel. This was common to all in-country agencies.
- Showing that good outcomes could be achieved with simple techniques benefited and expanded the skills base of National staff directly involved in waste management.
- These acquired skills have decreased over time as other waste management projects have not mobilised. This has minimised cross-cutting transfer into related waste management areas.

3.3 AUSAID MANAGEMENT

Table 3.3 AusAID management

Factor	Issue	Strategy/Outcome
Project operations delayed due to a range of issues.	Major changes to project time lines and costs.	AusAID management approval of changes in funding enabled completion of the Phase II Project despite difficulties. Positive outcomes reflected results of good communications strategy and trust between all parties.

Overall assessment

- Confidence between AusAID and the AMC strongly contributed to maintaining support despite obstacles.

- Without this relationship, it is unlikely the project objectives would have achieved the same degree of success.

3.4 ACTIVITY MONITORING

Table 3.4 Activity monitoring

Factor	Issue	Strategy/Outcome
Maintaining management oversight of project operations	Appropriate monitoring of project progress	AMC issued a series of project reports to AusAID (Appendix C) describing achievements against project goals (defined in Components 2, 3 and 4 of PDD).

The ICR reviewed many of these interim project documents and concluded they provided sufficient information on progress in various activities.

Overall assessment

The project maintained reporting of project progress at a sufficient level to support management decisions.

To assist future review or historic revisiting, these records should be compiled onto a master digital record for forming a chain of custody of project stages for archiving. Key documents should be kept as hard copies in the archive as a failsafe against long term software changes and degrading of digital records.

3.5 ACHIEVEMENT OF OBJECTIVES

Project objectives (Section 1.4.2) were achieved for the 12 PICs in the Phase II Program. The methods used in achieving these objectives were appropriate to the geographic constraints of the project area. Comments on lessons learned and benchmarking are discussed in later sections

3.6 STANDARD OF OUTPUTS

Outputs of the Phase II program were to achieve objectives and remove the threat of environmental contamination for less developed and resource constrained island nations.

Table 3.5 Standard of outputs

Assessment observation	Support for observation
The standard of outputs observed during site visits and from interviews with stakeholders was consistent with world best standard practice.	• Clearly documented reporting of actions taken. • A chain of custody was always attached to movements of contaminated materials and was in conformance with international treaties. • Clear and unambiguous documentation of final destruction of these compounds to best standard practice for these disposal processes. • Appropriate monitoring of project progress clearly documented and described activities undertaken.

3.7 BENEFITS TO TARGET POPULATION

Table 3.6 Benefits of target population

Factor	Issue	Strategy/Outcome
Poor storage of POPs.	Health risk to residents in the vicinity of storage facilities.	Collection, removal and destruction of 127 tonnes of POPs from participating PICs.
Residual contamination of food production and wider environment.	Limited threats of exposure remain at some sites due to contaminated soils and buildings.	Primary sources of ongoing contamination have been removed. Greater awareness raised of health risks and the need for site isolation if full site cleanup not achieved. Risk greatly reduced.

Table 3.7 Contributing notes

Assessment observation	Support for observation
Major direct benefits to target populations by the physical removal of POPs near residential areas or in poorly maintained storage sites.	• Well documented reporting the actions taken. • Strong affirmation by local agencies and residents of improved conditions. • This residual risk will decrease over time with natural weathering under the high humidity and elevated temperatures typical of the Pacific Islands.

4 Impact assessment of the Phase II Project

4.1 SUMMARY OF IMPACTS

Table 4.1 Summary of impacts

Impact type	Impact description	Commentary
Positive	Permanent removal of risks of contamination associated with stockpiles of POPs by removal and destruction of these compounds.	Methodology used and inclusion of a wide spectrum of stakeholders, both in PICs and back in Australia provides a benchmark approach for future programs of a similar type.
Positive	Risk minimisation in management of hazardous wastes.	Demonstration of simple but effective techniques for risk assessment, cleanup and removal of POPs. Methodology transferable to other hazardous wastes.
Positive	Indirect benefits.	Perception of improved environmental quality with possible positive flow–on effects to tourism, export agricultural products and artisanal food production.
Negative	Potential for remaining contamination.	Removal of main sources of contamination did not include residual contamination assessments and likely scope of decontamination of major sites.

4.2 MEASUREMENT OF IMPACTS

Other than the quantitative totals of POPs and related chemicals removed from different sites for destruction at BCD Technologies, most impact measurements were qualitative and have been discussed in preceding sections.

4.3 COST BENEFIT APPRAISAL

The AMC did not undertake a quantitative cost benefit analysis on the Phase II Project as many of the factors involved (land costs, community health expenditure, alternative solutions) were not amenable to quantification. The ICR likewise recognised this limitation but notes the following factors are significant.

Table 4.2 Cost benefit appraisal

Issue	Strategy/Outcome
Demonstrated cost benefit	Difficult to achieve as only one acceptable solution was defined: (removal of POPs).
	Sufficient budget was made available to complete the task in the 12 PICs.
	127 tonnes of POPs removed from participating PICs.
	Initial stakeholder consultation gained support from key stakeholders preventing delays and a strong culture of confidence between AMC and all parties including government agencies (e.g. DEWHA, DAFF, and QEPA).
	Undertaking reconnaissance then removal in a regional group of several PICs minimised transport and logistics costs, simplified associated administrative activities (approvals, permits, communications) and saved time compared a country by country approach.
	A single-source disposal simplified logistics and provided administrative efficiencies.
	Project scope was clearly defined and focussed the Project to the tasks in hand for efficient project implementation.
	Practical techniques in cleanup and repackaging of POPs provided cost efficiencies by being flexible in approach, readily mobilised and adaptable to changes at short notice.
	Contributed to regional awareness raising and capacity building activities complementing initiatives by other international aid programs to PICs. (e.g. Global Environment Fund programme).
Overall assessment	the circumstances, few alternatives were available to improve cost benefit. General alternatives, such as considering cheaper destruction methods outside Australasia, were not been considered for this project.

4.4 COST EFFECTIVENESS

A cost effectiveness review expressed as calculation of indices such as economic net present value (ENPV) and/or economic internal rate of return (EIRR) are severely restricted by a single-source disposal and very few options for logistics to remote locations. The AMC attempted to partially minimise costs by regional blocking of activities but were constrained by circumstances.

Table 4.3 Cost effectiveness

Issue	Strategy/Outcome
Demonstrated cost effectiveness	Difficult to achieve as very limited range of solutions to issues. Very broad geographic area involved, long sea transport distances, uncertainty in services due to a range of societal and seasonal climatic conditions. Lack of local expertise for POPs cleanup program and specialist shipping requirements required full staffing of cleanup and logistics by Australian contractors. Sole source disposal technology used a technique that has high specific costs compared to a cheaper incineration option as in Europe and elsewhere. In context this was still a minor (13%) cost item in the overall budget (see below).
Overall assessment	A per kilogram cost of approximately A$53 is high in an international context but is not directly comparable due to PICs specific factors. The cost summary provided by the AMC demonstrates the high overheads associated with logistics in remote locations namely – project management 34%; – shipping 24%; – cleanup, local transport and procurement 18%; – destruction costs 13% and – communications 5% – Unspent 6% of (total budget $6,771,432).

4.5 SUPPORT FOR AUSAID'S POLICIES

Table 4.4 Support for AusAID's policies

Issue	Strategy/Outcome
AusAID policy support	Fulfils position that degradation of natural resources has adverse impacts upon health and ability to meet basic needs including traditional food resources and clean water[3]. Improved environmental quality assists in poverty reduction through development of economic opportunities directly relating to high environmental quality (fishing industry tourism)[4]. Gender benefits specifically to women as POPs can accumulate in body fat reserves then mobilise during pregnancy and in breast feeding. This can directly impact development and successful nurturing of healthy children. Removal of POPs removes the risk of contamination over a wide geographic area associated with: direct dispersion through airborne and waterborne contamination. through the food chain via traditional food crops and pelagic fish.
Overall assessment	Removal of POPs is entirely consistent with AusAID policies for poverty reduction and preservation or enhancement of environmental quality. Has a direct gender benefit through health and welfare risk reduction for women and children, particularly at the earliest stages of child rearing.

[3] AusAID (2001)

[4] AusAID (2007)

5 Sustainability

5.1 BENEFITS TO TARGET POPULATIONS

Section 3.7 summarises the benefits to target populations, namely the residents of small Pacific Island communities, likely to be directly or indirectly affected should mobilisation of POPs occur into their local environments.

The removal of stockpiles of POPs has resulted in a great reduction in the risk of contamination of traditional food resources including fish – frequently their major source of protein.

5.2 INSTITUTIONAL CAPACITY

Table 5.1 Institutional capacity

Issue	Strategy/Outcome
Increased institutional capacity in PICs	1. SPREP assistance in supporting awareness-raising on POPs, benefits of their removal from PICs and project publicity helped consolidate SPREP as a regional centre of expertise, facilitator and coordinator of environmental management. 2. GEF waste management program benefits from demonstration of the importance of waste management plans in hazardous waste management. 3. Initial workshop facilitated by SPREP for 10 PICs for training them on waste shipment obligations and processes through the Waigani Convention. 4. AMC staff providing on site practical advice and demonstration of techniques to personnel in government agencies. 5. Methods used have wider application in waste management: • Waste identification • Waste handling • Waste segregation • Waste stabilisation • Recycling of wastes • Waste disposal. 6. Discussions between three PICs agencies and the ICR team reinforced the value of demonstrations of practical skills that consolidated theoretical knowledge from workshops and other training.
Loss of skills and equipment needs	1. Loss of specialist knowledge through promotion within an agency needs offsetting by continued staff training to maintain agency skills. 2. Most PICs lack funds for basic maintenance, spares and fuel for specialised machinery. Supplies of simple manual equipment are often lacking for the same reason and hiring appropriate machinery as needed. 3. Simple robust methods demonstrated by the AMC provided valuable lessons on cost effectiveness and use of existing skills and basic machinery known to and maintained by local personnel.
Need for additional assistance in other waste streams	1. Discussions with national staff showed that POPs management is a small part of wider concerns over waste management in PICs. Most have land constraints and limited capacity to effectively collect, separate and manage mixed waste streams 2. Waste management practices and waste disposal sites on Upolu (Samoa), Rarotonga and Aitutaki (Cook Islands) and on Guadalcanal (Solomon Islands) showed that all have considerable room for improvement. 3. Most lacked fully operational equipment, proper security and full time supervision. Their waste streams comprise mixed wastes (including medical waste). Future environmental problems from poor waste management are highly likely.
Overall assessment	1. Removal of POPs is entirely consistent with AusAID policies for poverty reduction and preservation or enhancement of environmental quality. 2. Has a direct gender benefit through health and welfare risk reduction for women and children, particularly at the earliest stages of child rearing.

5.3 RECURRENT COSTS

Table 5.2 Recurrent costs

Issue	Strategy/Outcome
Sustainable funding issues	1. Future assistance could include administrative strengthening on tariff and cost recovery to maintain a secure financial base. Without this support, the capacity to manage all wastes including hazardous wastes will decay due to lack of resources and attrition of skills. 2. Providing key items of equipment (protective clothing, suitable containers (e.g. heavy polythene bags, drums, shrink wrapping), and shipping cost support) as a cyclic grant will assist in compliance with hazardous waste management procedures.
Overall assessment	1. Recurrent costs are poorly met under current internal funding arrangements 2. Additional administration inputs, recurrent equipment grants and training assistance will support and complement activities through SPREP and other donor inputs within PICs. 3. A review mission in three years time is recommended to determine the retention of skills and current practices in waste management including management of POPs and other hazardous wastes.

6 Conclusions and lessons learned

6.1 OVERALL ASSESSMENT

The assessment in Table 6.1 uses standard indicators for projects as listed in AusGuideline 5.1.

Table 6.1 Overall assessment

Rating Category	Commentary	Rating assessment
Management and contracting	Standard form contract for appointment of an AMC. Project proceeded to completion with three variations to budget. Ability to accommodate changes seen as a strength, given the multi-nation and multi-cultural nature of this project.	Strongly agree that these project arrangements were completed and rate satisfactory.
Objectives	Original objectives achieved with the removal of POPs from 12 PICs and the successful destruction of this waste at a licensed facility using accepted standard practice for this technique.	Strongly agree that objectives were achieved and rate satisfactory.
Achievement	AMC achieved the component objectives, project purpose and project goal.	Strongly agree that these achievements were completed and rate satisfactory.
Aggregate benefit	By achieving the objectives of the project, aggregate benefits were achieved by major reductions in risk to human health and welfare and similar great reduction in risk of contamination to the wider environment.	Strongly agree that benefits were tangible and sustainable and rate satisfactory.
Impact	As per preceding, the project markedly reduced impacts of potential hazards.	Strongly agree that potential impacts were greatly reduced and rate satisfactory.
Poverty reduction	By removing of large quantities of POPs from 12 PICs, the project substantially contributed towards reduction of risks of poverty becoming entrenched in these communities. These actions supported the continued use of traditional foods and wild harvest of marine species without concerns over biomagnification of hazardous organic compounds.	Strongly agree that poverty risk ratings were reduced and rate satisfactory.
Environmental impact	The program used effective hazard removal techniques that were of low impact to surrounding environments. Removing sources of ongoing contamination substantially reduced risk of potentially severe environmental impacts. Residual impacts remain (contaminated building materials, soils) at some sites. The scope of the program did not allow for complete decontamination of sites.	Agree that environmental impacts were reduced and overall rate satisfactory.
Gender impact	Chronic and toxic effects of POPs upon human health were greatly reduced. Specifically these were of greatest benefit to women and children as outcomes minimised the risk of POPs transmission through body fat mobilisation during pregnancy and breast feeding. Remaining contamination at former sites still presents a risk – albeit much reduced by POPs removal.	Agree that adverse gender impacts were greatly reduced in risk profile and rate satisfactory.
Cost benefit	Qualitative indicators suggest project had an acceptable cost to benefit ratio. Opportunities exist for cost savings by fewer delays in retrieving of wastes if undertaken again. The one-off unique nature of this program in a Third World situation prevented more precise assessment of this indicator.	Agree that cost benefit ratings are satisfactory.
Value for money	Reflecting comments above, this attribute was accepted as best value for money against ‘do nothing’: this latter position being a high risk option for human health and environmental degradation.	Strongly agree that value for money ratings are satisfactory.
Monitoring	Project achievements and outcomes monitored against achievement of project components through Annual Reports, PCC meeting presentations and end of activity reports. These monitoring tools provided sufficient inputs to maintain information for external and internal management.	Strongly agree that monitoring ratings are satisfactory.

Rating Category	Commentary	Rating assessment
Technical assistance	Well defined project procedures that initiated community consultation and inclusion as an initial step provided a best practice example of a project management process for a community based project. High quality technical assistance through use of international instruments for the shipment of wastes, practical demonstration and advisory training of POPs cleanup and the importance of QA for logistics. Procurement of materials and adoption of simple and effective solutions. Some revisions to procedures (e.g. cost savings) are now evident and are discussed in lessons learned.	Strongly agree that technical assistance ratings are satisfactory or better.
Risk management	Risk management was accommodated through active choices of techniques for undertaking site cleanup and following rigorous shipment procedures. The extensive practical experience of the AMC team and clear management protocols ensured risks were kept to as low as practical. Although political and weather risks were initially underestimated, their handling was well managed.	Agree that risk management ratings are satisfactory.
Activity coordination	Activities were generally well coordinated. Sequential tasks were undertaken as planned but some time delays between initial reconnaissance and cleanup and waste removal occurred. Some of these delays were in part due to factors beyond the control of project personnel.	Strongly agree that activity coordination ratings are satisfactory.
Partner government	Some PICs lacked sufficient numbers of tertiary trained staff thus had very limited technical capacity to effectively participate in the program and to absorb additional training. Likewise the capacity of governance was insufficient to fully incorporate the needs of the Waigani Convention into governmental processes. This capacity varied markedly across different island states. Capacity limits of individual partner government capacity affect their ability to fully utilise the lessons learned and their capability of resourcing future management of POPs and other specific waste streams This is a structural problem which cannot be solved by an isolated project and would need a holistic institution approach.	Agree that partner government ratings are satisfactory.
Implementing agency	Reflecting comments above, comments by PICs representatives suggest that agency capacity varies widely between island states. Some PICs have several staff in the implementing agency and can deploy specific staff to POPs related issues. Elsewhere, these manpower resources are lacking. Consequently the capacity of implementing agencies varies widely across member nations.	Neither Agree or disagree that implementing agency ratings are satisfactory.
AusAID	The continued support and confidence of AusAID in the AMC was pivotal in ensuring sufficient resources were mobilised over and above the original project budget in order to ensure project completion. The views and support of members of the PCC were also recognised as part of this extension process. These strengths enabled project personnel to seek solutions that were not originally foreseen in the Project Design Document and contributed to the overall success of project outcomes.	Strongly Agree that AusAID inputs ratings are satisfactory.
Delivery organisation	The ICR team have formed a very positive opinion of the performance of the AMC team as a delivery organisation. Strengths of this team that were noted: 1. Very effective and timely community consultation focussing particularly upon openness, transparency and building of trust between all stakeholders.	Strongly Agree that Delivery organisation inputs ratings are satisfactory or better.

Rating Category	Commentary	Rating assessment
	2. All stakeholders contacted by the ICR team were uniformly positive when describing their dealings with AMC team members throughout the course of the project. Issues such as empathetic communications, promptness and a professional manner were frequently mentioned. 3. A very professional capability of the field team undertaking initial confirmation of POPs quantities and subsequent POPs removal. Their use of robust, simple and effective techniques under often very challenging circumstances was evident.	
Recipient/Beneficiaries	Informal and formal discussions between ICR team members and agency staff from several PICs indicated that recipient views of their interactions with AMC staff were very positive, especially with the field team. PICs representatives realised that the inputs of AusAID and the AMC provided a solution to an otherwise intractable problem that had long term adverse consequences to their respective communities if unsolved. Agency personnel noted the field team were very informative and helpful as they demonstrated what had previously been theoretical concepts. These agency staff appreciated free sharing of knowledge and expertise and the team's willingness to assist in related waste management issues. This occurred when advice was sought or when the situation was warranted. Such suggestions were made by the field team to address the lack of expertise in agency staff.	Strongly Agree that recipient and beneficiaries ratings are satisfactory or better.
Financial sustainability	This aspect of the POPs in PICs program is of concern to the ICR team due to the financial limitations of the national economies of some island nations. Waste management often has a low rank against more pressing needs such as education, health and infrastructure (roads, water supply, and sanitation). To date there has been limited direct aid to purchase equipment and seldom any support for longer term maintenance. Consequently the waste management systems, of which POPs are a part, are often absent or poorly managed due to the lack of budget to cover running costs and maintenance. The lack of capacity to self fund through an internal rating for service suggests that lessons learned in POPs will have application to assistance programs for other hazardous waste streams Given a very low per capita income in some subsistence communities, the capacity of PICs to manage POPs and other hazardous wastes is likely to be very limited or eventually cease unless supported externally.	Strongly disagree that financial sustainability ratings are satisfactory for many PICs (due to the limitations of their respective economies).
Technical sustainability	Previous discussions note that only some PICs have the technical capacity to maintain sufficient skills in waste management that would rate them as sustainable.	Neither Agree nor disagree that technical sustainability ratings are satisfactory.
Institutional sustainability	Previous discussion on financial sustainability and fiscal capacity of individual PICs suggests that institutional sustainability varies between island nations. Nations with small economies are unlikely to maintain this capability due to more pressing matters using up their national budgets.	Neither Agree nor disagree that institutional sustainability ratings are satisfactory.

6.2 LESSONS LEARNED

Observations of the ICR team, their discussions with the AMC, AusAID and project stakeholders have resulted in the following summary of lessons learned.

6.2.1 Inclusive stakeholder communications program

The AMC Communication Strategy implemented early in the project resulted in a clear understanding of the concerns of key stakeholders in Australia prior to undertaking any actions to remove and treat POPs. Successful dialogue established a basis for cooperation between all parties ranging from counterparts in PICs, through Federal and State agencies and into the local community at Narangba. All played a part in the success of the project particularly in understanding their role in the chain of actions to complete the whole process.

This led to the conclusion that early implementation of an effective and inclusive stakeholder communications program provides a much greater probability of successful project outcomes.

6.2.2 Third party reviews

The successful use of an independent ombudsman whose neutrality is assured overcame the lack of trust between the community stakeholders and BCD Technologies. The importance of an independent third party undertaking thorough reviews of critical elements of a project (such as monitoring of disposal processes) cannot be underestimated. It provides the necessary levels of confidence to continue with a course of action or supports a change in approach to address shortcomings.

6.2.3 Project flexibility

Having a robust project structure that could respond to changes to the sequence of project activities contributed to the successful management of project risks. These included civil unrest, changes to shipping schedules and shipping routes, time spans of approvals and permits and delays in ratification of international agreements.

Other changes included increased quantities of POPs into the removal and destruction program reflecting increased public awareness from local media and government news reports.

The ability of AusAID to accommodate these changes, adjust project timelines and increase funding as needed allowed the outcomes to be achieved despite these constraints.

Accommodation of these changes reinforced the strengths of conducting regular stakeholder updates throughout the project and adopting practical methods for the collection and packaging of wastes.

6.2.4 Progress staging and finalisation of activities

The time delay between Phase I and Phase II and uncertainties in the characteristics and volumes of some wastes necessitated a reconnaissance visit to each PIC prior to uplift of wastes to ensure the problems faced were well understood. The outcome was

a confirmation of waste quantities, waste types and availability of access to waste sites.

A very important part of this initial visit was to meet with counterparts in national agencies in each participating PIC.

A stepwise approach facilitated efficient planning of repackaging and completion of details for shipment of wastes. By having this detailed knowledge, discussions with in-country stakeholders could be undertaken with confidence and respond to any concerns. This was a significant factor contributing to the success of the project.

6.2.5 Mobilisation of waste export and import processes

Movement of wastes through PICs and into Australia followed protocols of the Waigani Convention that in turn complied with protocols of the Stockholm convention. The POPs in PICs project was the first practical application of this regional treaty. This situation required capacity building of PIC's government agencies and clear communication with PICs and Department of Environment, Water, Heritage and the Arts (DEWHA) through the life of the project.

As permit processes for Department of Agriculture, Fisheries, and Forests (DAFF), Customs and Agricultural Quarantine Inspection Service (AQIS) were dependent on the DEWHA approvals, synchronising permitting processes took more time than originally anticipated.

6.3 RECOMMENDATIONS

6.3.1 Extension of Phase II activities to other PICs

PNG was not part of this POPs in PICs program but was an observer to some regional meetings. Delegates from PNG have now requested AusAID seriously consider a similar POPs removal program for the large quantities of POPs wastes present in PNG. Removal of POPs waste stockpiles would benefit large numbers of people with very limited capacity to improve their welfare. Other PICs such (e.g. Palau) upon achieving full compliance with the Waigani Convention may be interested in combining with PNG in an extension of this program.

6.3.2 Extension of Phase II activities to other wastes

The problem

The POPs Phase I and II programs identified large quantities of other wastes remain in PICs. These also require management and removal but as they represent a wide range of substances, specific disposal solutions are unlikely to be as uniform as for the POPs in Phase II.

Incorrect waste disposal practices will increase the problem (for example low temperature incineration of chlorine containing plastics generating dioxins and furans or disposal of untreated infectious wastes within the municipal waste stream). These issues present the need for integrated waste management programs comprising technical assistance, investment in infrastructure and capacity building. Long-term ongoing funding will also be required (Section 6.1).

Current progress

Programs organised by SPREP and supported by other donors are raising awareness of these many different waste types and their specific solutions such as waste separation and recycling. However few PICs seem capable of putting these theoretical solutions into practice.

The strength of the Phase II program was a practical demonstration that a solution to a problem can be planned, mobilised and removed within a reasonable time frame. However, the POPs program addresses a one-off problem while other waste streams require long term and ongoing solutions that establish a sustainable outcome.

Possible actions

A long term practical support program should be seriously considered that would remove risks posed by other municipal and hazardous wastes. Some issues can be solved with defined time lines and goals as in this present POPs project. Most others would be ongoing.

These programs would need to integrate with national waste management plans facilitated by SPREP. A strong suggestion is that any additional training would have far greater significance to participant nations if it included a practical solution to an existing waste problem as part of such a capacity building program.

Feedback on training and institutional strengthening

On several occasions during discussions with agency members from several PICs, their strong preference in future is for practical application of skills during training. Having seen personnel undertake POPs cleanups has had a greater impact than many hours of training.

This reflects the culture common to Pacific Island nations where skills are traditionally passed down by learning through personal contact and putting these into practice in real situations. Training without immediate practical application would appear to have little long term value as theoretical skills degrade over time.

6.3.3 Institutional strengthening to manage potential hazards

During discussions at SPREP and with representatives in agencies in Samoa and the Cook Islands, it was apparent that serious attention is being paid to limiting the import of potentially hazardous materials in some PICs. Declaration of legislation that controls imports varies widely between PICs with some nations having a single desk for these matters (e.g. through Customs and Excise) while others in contrast have few controls and allow direct unregulated imports.

Given the small size of the economies of most PICs and their smaller land areas, single desk import controls would seem appropriate. Consideration should be given to encouraging role modelling of best practice between these different island states through promotion of regional forums and visits to see the practical benefits of such controls being put in place.

The desired outcome is promotion of a uniform regional approach to materials that have the potential to create future hazardous waste problems

6.3.4 Adoption of the POPs communications strategy

The success of this Phase II project reflects the agreement of a wide range of stakeholders whose inputs and concerns were addressed through the project communications policy. This was backed up by the use of detailed, reliable and defendable information.

Serious consideration should be given by AusAID to use this approach as the basis for future benchmarking of similar technical projects.

6.3.5 Publicising the project

The POPs in PICs project overall is a story worth telling. The use of well planned and practical methods to remove a situation of high risk to human health and the environment should be made known to the wider Australian and international public. The value of this is also to demonstrate the thoughtful and appropriate use of aid funds from Australia to neighbouring countries in the Pacific to resolve an otherwise intractable problem.

6.3.6 Project closure

To achieve project closure in Australia and as a way of thanking the cooperation of these stakeholders, the ICR Team strongly recommend AusAID support the AMC and affiliates to hold a project presentation in Brisbane and Canberra. This could include attendance by representatives from representative perhaps three or four PICs and would enable stakeholder representatives in these two centres to understand their contribution to the project.

A closure presentation has already been given to PICs representatives at SPREP on 1 May 2008.

6.4 INCIDENCES OF GOOD PRACTICE

Discussions through this report have highlighted several instances of good practice associated with the project. These were in the areas of:

- Communications and stakeholder inclusion in the project processes.
- Practical and systematic waste quantification and removal.
- Flexibility and accommodation of changes at short notice imposed by external factors
- Appropriate institutional strengthening covering only those issues needing resolution of the problem to hand such as compliance with international treaties and the correct permitting for transport of wastes between countries.
- Use of best practice technologies for disposal of POPs wastes.

These matters have been discussed in context in preceding sections of the report.

Appendix A

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Appendix A
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Appendix B

TERMS OF REFERENCE FOR THE ICR

Appendix B

Terms of Reference for the ICR

The tasks for the team were to:

1. Undertake a thorough review of available documentation on the project prior to undertaking the next steps of the mission.
2. Use the information discovered in this literature review to prepare a Focus Paper for the mission outlining the activities to be undertaken and desired outcomes of an independent review of the Phase II Project. Submit this report to AusAID in Canberra and use this as a basis for discussion in planning the main investigative phase of the project.
3. Visit AusAID in Canberra to finalise project structure, methodology and reporting issues as described in the Focus Paper. Receive final instructions and detailed briefing prior to commencing the next stage of project investigations.
4. Meet relevant officers from the DEWHA, DAFF, Customs Service and AQIS who have been involved in various aspects of the project.
5. Travel to Melbourne to receive a detailed briefing from the AMC team based within the GHD Melbourne office and Hatler Consultants.
6. Meet with representatives of State and Local Government authorities in Queensland involved in the movement of POPs through the Port of Brisbane to BCD Technologies facility at Narangba. Meet with representatives of the local community at Narangba near the destruction facility. Obtain their views on the conduct of project activities in relation to their expectations. Meet with the operations manager and third party verification agency involved with the destruction of POPs wastes.
7. Visit Samoa to:
   - Discuss the conduct and outcomes of project activities with SPREP.
   - Meet with and discuss the project with representatives of Samoan government agencies taking part in the cleanup activities and with local landholders influenced by project activities.
8. Visit sites in the Cook Islands and the Solomon Islands with the assistance of SPREP to similarly review efficiency and effectiveness of their in-country programs undertaken during the Phase II project. As in Samoa, meet with and discuss the project with representatives of government agencies of each country taking part in the cleanup activities and with local landholders influenced by these project related activities.
9. Prepare a Note of Findings and submit to AusAID at the conclusion of the field program in the three representative PICs.
10. Meet with AusAID in Canberra to hold post-field debriefing and discussions including expanding upon the content of the Note of Findings
11. Undertake the production of a Draft ICR for the project and submit for review.
12. Following feedback from reviewing agencies including PICs involved in the project, undertake production of the Final ICR and submit to AusAID.

An optional activity is presentation of project findings to a wider forum in Canberra following acceptance of the Final ICR.

Appendix C

ICR TEAM MEMBERS

Appendix C
ICR team members

Team Leader: Chris Milligan

Chris Milligan is a Principal Environmental Scientist within KBR based in Brisbane with over 30 years' experience. This experience includes Team Leadership in India on an AusAID toxic waste management project for fine chemical and pharmaceutical industries. An earlier AusAID project involved assisting environmental management of the power industry in Thailand. His most recent AusAID project experience has been as Team Leader for the Quang Ngai Natural Disaster Mitigation Project in Central Vietnam.

Mr Milligan has worked on a wide range of environmental management issues associated with civil construction (highways, railways, pipelines, water supply dams, harbours, marinas), industrial development, operation of wastewater treatment plants and coal and base metal mining.

Waste management specialist: Umur Natus-Yildiz,

Umur Natus-Yildiz is a Senior Civil Engineer specialising in waste management projects. His experience includes waste management expertise for hazardous, healthcare, industrial, commercial and domestic (municipal) wastes. This includes concept designs, feasibility studies, detailed design and tender documentation covering waste avoidance measures, collection and transport systems Additional waste related experience includes site selection analysis, remediation of dump sites, composting and sorting plants, mechanical and biological treatment plants (aerobic and anaerobic), waste incinerators or waste-to-energy plants, landfills and leachate treatment systems

Mr Natus-Yildiz has also been involved in monitoring, reviews and evaluation of projects, strategic policy development and regulatory framework review; Public Private Partnership consultation and environmental impact assessments.

Appendix D

LIST OF PERSONS CONSULTED

Appendix D

List of persons consulted

Location	Name	Organisation
AUSTRALIA	Ms Susan MacDonald	AusAID
	Shona (surname not recorded)	AQIS
	Ms Dione Polatidis	DEWHA
	Dr. Greg Rippon	DEWHA
	Mr Damien Hall	DEWHA
	Ms Sonia Rankin	Australian Customs Service
	Mr Michael Collins	Australian Customs Service
	Ms Katie Butler	GHD (KB, DT) / Hatlar (GH)
	Mr Daniel Todd	GHD (KB, DT) / Hatlar (GH)
	Mr George Hatzimahalis	GHD (KB, DT) / Hatlar (GH)
	Ms Val Trajanovska	HK Logistics
	Ms Stefanie Pidcock	DEWHA facilitator
	Mr Chris Williams	Environmental Officer, Moreton Bay Regional Council
	Mr Gary O'Connor	Manager, Prjct Support & Technical Operations, EPA Qld
	Mrs Fran Jell	Community Stakeholder Group, Narangba
	Mr Daniel Allen	BCD Technologies, Narangba
	Mr Michael Taylor	Environmental Officer, Moreton Bay Regional Council
SAMOA – UPOLU	Dr Frank Griffin	Director, Waste Management and Pollution Control Section, SPREP
	Mr Clark Peteru	Legal Adviser, Waste Management, SPREP
	Ms Esther Richards	Solid Waste Training Officer, SPREP
	Mr Seumanu Mikaela Teofilo	Senior Landfill Officer, Dept. of Environment and Conservation (DEC)
	Ms Fuatina Matatumua	Principal POPs in PICs representative, DEC
	Mr Faleafaga Tony Tipama'a	Acting CEO, DEC
	Mr Toomata A Tuipe'a	General Manager, Agriculture Store Corporation, Apia
COOK ISLANDS – RAROTONGA	Mr Vavia Tangatataia	Manager, Compliance and Enforcement Division, Dept. Environment
	Mr Vaitoti Tupa	Director, Dept. of Environment
	Ms Tania Temata	Deputy Director, Dept. of Environment
	Mr Tai Nooapii	Works Engineer, Ministry of Works
	Mr John Wichman	Director, JLW Recycling
COOK ISLANDS – AITUTAKI	Mr Bobby Bishop	Environmental Officer/Liaison Facilitator, DEC
	Mr Sabati Solomona	Chief Administrative Officer
	Mr Fred Charlie	Senior Agricultural Officer
	Mr Natua (surname not recorded)	Landfill Manager
	Mr John Baxter	Local entrepreneur, waste management
SOLOMON ISLANDS – GUADALCANAL	Mr Fred Patison	Chief Environmental Officer, Environment & Conservation Division, Ministry for Forests, Environment, Conservation & Meteorology
	Mr Joe Horokou	Acting Director, ECD
	Mr Tia Masolo	Environmental Officer, ECD
	Mr Les Hewer	Seconded City Engineer, NZ AID project

Appendix E

CHRONOLOGY OF KEY ACTIVITIES

Appendix E
Chronology of key activities

Location	Date	Activity
AUSTRALIA	3 June 09	Morning: Briefing with AusAID and DEWAH, Canberra
		Afternoon: Meeting with Australian Customs Service
		Afternoon: Discussion with AQIS, Canberra
	4 June 09	Meeting with AMC and Hatlar, Melbourne
	5 June 09	Discussion with HK Logistics, Sydney
SAMOA – IN AND AROUND APIA	11 Jun 09 & subsequently in country 17-22 June 09	Discussions and meeting with Dr Frank Griffin at SPREP
	17 June 09	Informal discussions with SPREP staff
		Meeting with DEC, Ministry of Natural Resources and Environment (MONRE)
	18 June 09	Meeting with Dept. Agriculture Store manager & inspection of former POPs sites around Apia, inspection of Apia landfill
	19 June 09	Meeting with Acting CEO of Dept of Env and Conservation, consolidation of notes and reports at SPREP
COOK ISLANDS – RAROTONGA	24 June 09	Meeting with Director, Dept. of Environment
		Deputy Director, Dept of Environment
		Manager Compliance and Enforcement Division
	25-June 09	Inspection of POPs sites on Rarotonga
		Meeting with Ministry of Works
		Meeting with private recycling contractor
COOK ISLANDS – AITUTAKI	26 June 09	Meeting with Aitutaki Chief Administration officer and other government staff
		Inspection of former POPs sites on Aitutaki
		Inspection of Aitutaki landfill
		Meeting with local waste contractor
SOLOMON ISLANDS – GUADALCANAL	01 July 09	Meetings at Division of Environment and Conservation
		Inspection of former POPs sites in Honiara district
		Inspection of Honiara landfill
		Meeting with NZ Aid civic engineer
AUSTRALIA	17–24 July 09	Meetings and discussions with State and Local Government stakeholders in Brisbane region.
		Discussions with local community stakeholder representative
		Discussions with AMC community facilitator

Appendix F

ACTIVITY LOGICAL FRAMEWORK

Appendix F

Activity logical framework

Narrative summary	Verifiable indicators	Means of verification	Assumptions
GOAL			
To review the effectiveness of the AMC program to reduce potential risks and threats posed by POPs & related chemicals to human health and the wider environment in PICs			
PURPOSE			
To confirm the AMC program has achieved its goals of effectively collecting a range of POPs from participating PICs, efficiently organising their transhipping to Australia and ensuring their destruction using an approved process. These POPs were to include: • Polychlorinated biphenyls (PCBs), and PCB-contaminated solvents from transformers; small quantities of PCB-contaminated soil, • Stockpiled organochlorine pesticides including scheduled POPs; • Other intractable pesticides – mainly organophosphates and other unidentified pesticides likely to be treatable using the adopted disposal technology.	PICs program monitoring reports, shipping manifest reports, audit reports of the destruction program, progress reports to PCC and the AMC Project Completion Report.	Inspection of former sites cleared by the AMC program from a sample group of three PICs, interviews with participants in these countries and discussions with project stakeholders at all levels from POPs source to the site of their final destruction.	Inspections and discussions would provide a reasonable indication of satisfactory achievement of tasks. Detailed soil sampling at sites and subsequent analysis was not undertaken as this would require a major investigative program with consequent costs well beyond the present budget. Destruction of POPs followed protocols verified by BCD operational reports and QEPA license conditions.
OUTPUTS			
Output 1: Prepare a Focus report and travel plan for preparing an ICR.	Focus Report.	Focus report accepted and approval given to proceed.	
Output 2: Preparation of a Draft ICR. This comprised a series of subsection activities.			
1. Contact key stakeholders in Australia. Discuss project execution, project management and perceptions of outcomes;	List of stakeholders obtained from the AMC.	Short notes of meetings and telephone discussions with individual stakeholders and representative agencies (Federal, State and Local Government).	Stakeholders willing to discuss and comment on program.
2. Contact SPREP and arrange site visits to former POPs sites in Samoa, the Cook Islands and the Solomon Islands;	Travel plan and list of meetings and agencies.	Notes of discussions and outcomes. Site specific visit reports for inclusion in the ICR.	SPREP staff available to assist.
3. Interview representatives in counterpart agencies in the three PICs on their experiences and lessons learned through the POPs in PICs project;	Meet agency staff in each country.	Notes of meetings and discussions with agency personnel and other stakeholder individual and organisations.	Assistance by Partner government representatives in each PIC.
4. Prepare a Draft ICR on the POPs in PICs program and present this to AusAID representatives in Canberra.	Draft ICR and presentation notes.	Draft ICR document and record of meeting submitted to Canberra on 28 August 2009.	
Output 3: Incorporate review comments and submit a final ICR		Final ICR accepted by AusAID.	

Appendix G

SITE TECHNICAL REPORT SHEETS

Appendix G

Site technical report sheets

Samoa: *Upolu*

Agricultural Storage Building at Vaitele, a western suburb of Apia

1

2

3

4

Description:

The agricultural storage building is on the outskirts of Apia and is the central point for a wide range of agricultural materials including pesticides. Originally POPs were stored in a back storeroom of approximately 15m^2 within this building.

Clean-up result:

Following removal of the accumulated POPs under the Phase II program, the whole building underwent major renovations. This resulted in the former storage room being completely stripped of its old fittings, original walls and ceiling panels as well as excavation of the concrete floor. This building debris was removed and disposed of at the engineered landfill that services Apia, the surrounds and some specialised wastes from Savaii. This landfill is located about 5km west of the warehouse.

At the time of inspection the former storage room had just completed extensive renovation with a new tiled concrete floor, new concrete block walls and new floating ceiling panels. Also new were exterior windows, bench space and a sink (Plate 1). This extensive refit plus the lack of any trace odours or visual evidence of its former use clearly indicates that this former site is now without hazard provided no chemicals have deposited in the ceiling space that could filter down

at some future time. This is appropriate for it intended use as a lunchroom for staff at the store.

Current risks from hazardous chemicals:

Pesticides and other agricultural chemicals that are sold through the warehouse are now stored in a dedicated storage room of approx. 15 m^2. The room is lockable, has heavy duty timber shelving, has clearly labelled and stacked products and has an industrial sized extraction fan ventilation system (Plate 2). Current risks are thus very low.

Current problems:

- Chemicals not removed by the project (pesticides with metallic components) have been relocated into another storage room (Plates 3 and 4). These are considered non-marketable and have been written off the books as stock. Some of these chemicals are given free to farmers on request as a disposal measure, but no other longer term solution has been determined. The roller door to the room is broken and cannot be locked. No special hazard prevention measures have been taken. This situation should be rectified by better lighting, clear labelling, fixing the door and providing extraction ventilation. A full inventory of this expired stock should be kept in the room and adjusted as product is given away to farmers.
- The locked pesticide storage room has wooden shelves, which should be replaced by metal shelves to minimise potential contamination of shelving materials. This currently porous material could create a future disposal issue.
- Clear hazard signs should be installed on the door to the new storage room and also each side of the entrance into the remnant stock room.

Suggested donor aid:

Removal of the remaining expired chemicals and transportation to an appropriate disposal facility (for example an incinerator in Japan) for final destruction.

Samoa: *Upolu*
Electrical Power Company transformer storage area at Vaitele, a western suburb of Apia.


1


2


3


4

Description:
The former storage site of transformers cleared by the Stage 2 program was an open space with an area of approx. 20 m^2 adjacent to a service garage in the Electrical Power Company (EPC) compound (Plate 1).

Clean-up result:
After the removal of PCB contaminated transformers, soil in this storage area had been disturbed with a trench approximately 2m on a side and about 1.5m deep excavated in one corner of the site (Plate 2). Excavated soil seemed to have been used for fill material on an immediately adjacent building site.

The soil profile of that trench did not show any visible traces of oil nor did 3 small test pits approx. 12 cm deep that were dug at random at other places over this small site by the visiting staff (Plates 3 and 4).
Regrowth grasses and weeds providing soil cover showed no marked differences to that of adjacent vegetation. Overall it was concluded that there might be a small potential risk of remaining PCB contamination. Any further movement of soil or use of this area for agriculture is not advised without thorough testing of the soil.

A possible management measure is to level the site with the topsoil used to bury the domestic solid waste accumulating in the trench. This would minimise further site disturbance and

provide possible parking for vehicles or with gravel or tar sealed surfacing, an open air storage hardstand.
Current risks from hazardous chemicals: The trench was about half filled with mixed domestic wastes. Industrial solid waste (fittings, old cable) littered the site. No chemicals are handled intentionally on that site and this area appears derelict without a scheduled use. For this reason it was classified as having minimal residual risk.
Current major problems: No problems appear to be occurring other than unmanaged solid wastes disposal possibly as a means to fill the trench.
Suggested donor aid: None.

Samoa: *Upolu*
Waste disposal complex, Alafala'ava Road, west of Apia


1

2

Description:

The waste disposal complex is located about 6km from the centre of Apia within a fenced area of 100 acres (approximately 45.5ha). This compound is dedicated to waste disposal activities and has a landfill area (Plate 1), a small composting area, an interim storage for bulky wastes and a healthcare/medical waste incinerator (Plate 2). Hazardous wastes are stored in regular 40 ft containers. Sludges are stored in a shallow, lined basin.

Clean-up result:
No clean up was executed at that site.

Current risks from hazardous chemicals:
Hazardous chemicals and materials are stored in 40 ft containers near the site office.

Although contained, there appeared to be no long term plan of management or disposal

Current problems:

- No destruction processes have been planned for any hazardous wastes collected at this site. Shipping containers storing these materials are not sealed or locked.
- The healthcare waste incinerator was a diesel-electric design of two chambers – an initial preheater to 700^{o}C and a second chamber supposedly reaching 1,300^{o}C. There was a simple dust filter downstream of the second chamber at the base of the low stack. This stack terminated about 4m above the roof line but below the level of surrounding trees.
- Limitations to this incinerator design are the lack of a quench to reduce the risk of post–chamber synthesis of dioxins and furans and lack of an active carbon filter to intercept possible dioxin emissions. It is recognised that these additional interceptors could create new problems such as ensuring proper operations of the quench, servicing and regeneration of a carbon filter and operation of an activated carbon filtration of wastewater from the quench to remove organics.
- Although the current engineered design of the landfill includes a leachate collection system, there is no base liner.
- It was apparent that a large fraction of the waste stream comprises organic material. There is no gas capture or flaring to minimise methane emissions. However as waste volumes are low this is understandable.

- The composting area is very small, not managed nor operated efficiently.

Suggested donor aid:

Based on observations of existing facilities and discussions on waste collection operations, it was evident that a waste management plan that included training on further process improvements through the entire waste management chain would greatly improve efficiency and conserve landfill space.

A project definition study and resulting feasibility addressing implementation of an integrated waste management is strongly recommended. This could include addressing:

- waste avoidance,
- improved recycling;
- separate collection of organics and production of compost;
- mechanical-biological treatment of the wastes prior landfill;
- secure funding of waste management services by levees or similar on-going funding;
- improved management of hazardous materials;
- institutional strengthening with particular focus on technical training.

Cook Islands: *Rarotonga:*

Waste disposal complex, Rarotonga Island.

1

2

Description:
The waste disposal complex is located in a narrow valley. The complex is divided into a landfill area (Plate 1) and a small sorting shed for limited recycling operations (PET bottles, aluminium cans, some glass bottles, steel cans) (Plate 2). Sludges are stored in a basin serving also as leachate treatment for the landfill. Due to land tenure issues this is the only site available for a landfill on Rarotonga.

Clean-up result:
No clean up was undertaken at this site.

Current risks from hazardous chemicals and/or wastes:

Hazardous chemicals and materials are not supposed to be accepted at site but several types of these wastes (mainly medical and pharmaceutical) were evident in the waste stream during the inspection of this landfill.

Current problems:

- No destruction options for hazardous wastes (e.g. medical wastes) on the island.
- The design is as a sanitary landfill with a leachate collection/treatment system. Large quantities of recyclable and organic materials are present in the waste stream, there is no gas capture or flaring but understandable given the low waste volumes.
- The above mentioned land tenure issues restrict this site as the only possible landfill on Rarotonga. Disposal volume is thus of high value and although designed for 15 years, half of the capacity has already been filled with only 5 years of operation.

Suggested donor aid:
Based on existing facilities, a more coordinated training program for waste management planning of the entire waste management chain would be appropriate. This could comprise a concept study that defined the terms of reference for a feasibility study to address possible options for an integrated waste management system. Issues could include:

- waste avoidance and recycling;
- separate collection of organics and production of compost;
- compaction of wastes prior landfill;
- use of geotextile as an interim coverage material (c.f. airspace lost by soil cover);
- ongoing funding of waste management services;
- options planning for destruction of hazardous materials.

These goals are likely to require a combination of institutional strengthening, technical training and provision of appropriate plant and equipment to start the process and provide proof of concept to encourage participation and support.

Cook Islands: *Rarotonga*,
Agricultural Store at Totokoitu


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Description:
The former storage site of POPs chemicals was in a dedicated room of approx. 10m^2 within a dilapidated storage building with open sides (Plate 1).

Clean-up result:
After removal of the POPs, this storage room has had further use as a store for other chemicals that were not part of the POPs project (Plate 2). All chemicals identified as part of the POPs in PICs project have been removed.

Current risks from hazardous chemicals and/or wastes:
Some non-POPs pesticides are present as powders in sacks in an area that also includes sacks of fertilizers and other agricultural chemicals. These were in rough stockpiles in several parts of the same building (Plates 3 and 4). Some are still exposed to the weather (Plate 3).

Current problems:
- The lease of this agriculture store is about to terminate and no solution on management of remaining chemicals (mostly fertilisers and laboratory chemicals) has been proposed.

The current roof leaks and most external walls are missing. Bags are breaking up due to

weathering and chemicals are spreading throughout from the building.

Suggested donor aid:
Removal of the laboratory chemicals to an appropriate disposal facility (probably overseas) and repackaging of broken bagged materials into smaller heavy duty polyethylene sacks.

Recommend to authorities that these re-bagged materials (mainly fertilisers) be made available to local farmers free of charge.

Cook Islands: *Aitutaki*
Waste disposal complex

1

2

Description:
The waste disposal complex is located in a flat area and can be extended considerably. The complex is divided into a landfill area (Plate 1) and a small sorting shed. Sludges are stored in a basin also serving as a leachate treatment system for the landfill (Plate 2).

Clean-up result:
No clean up was executed at that site.

Current risks from hazardous chemicals and/or wastes:
Hazardous chemicals and materials are supposed to be rejected but some (mainly medical) were noted in the landfill.

Current problems:

- The landfill is a sanitary landfill with a leachate collection/treatment system with treatment by recirculated aeration. Unfortunately the recirculating pumps were broken at the time of inspection and had been out of commission for some time.
- There is still a reasonable fraction of recyclable material disposed of into landfill despite sorting and separate collection;
- A large part of the waste stream comprises organic material. No methane gas capturing or flaring occurs but this is understandable due to the low waste volumes.
- Landfill liners have localised damage and the layer of capping soil is too thick (circa 400mm). The open face of landfill is too large for the small waste quantities generated on the island consequently collects too much leachate adding to management problems.
- There are no facilities for destruction of hazardous wastes of any description (e.g. medical waste) on the island.

Suggested donor aid:
Assistance to remodelling and repair the landfill to minimise leachate volumes and leachate treatment thus improve operations.

Supply of appropriate landfill operation training including assistance in marketing and removal of collected recyclable materials.

Solomon Islands: *Guadalcanal*
Metapona Plains rice project – storage building


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2


3


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Description:
Former storage of POPs comprising approx. 30 m^2 of a building shell in the middle of former rice fields (Plates 1 and 2).

Clean-up result:
POPs were removed from the building and the floor cleaned. Both the building shell and surrounding fields have not been used since the cleanup.

All POPs agricultural chemicals and other materials formerly in the building were removed as part of Phase II.

Current risks from hazardous chemicals and/or wastes:
No chemicals or wastes remain exposed at this site.

Current problems:
- Inside the shell of the building, a weak pesticide odour was still evident. From photographs taken by the Phase II cleanup team. It was evident that the concrete slab and lower walls were saturated with agricultural chemicals and are therefore still hazardous. As there is no roof, contaminants are probably still leaching from these surfaces (Plate 3) and continuing to

contaminate runoff from the site resulting in damage to fringing vegetation (Plate 4).

- Changes to the species composition and growth form of local grasses and related vegetation provided an indication of the extent of current contamination. This would need verification by a gridded sampling program around the site especially in the direction of runoff outflows.

Suggested donor aid:

Complete remediation of the site would require removal of the contaminated building concrete shell and surrounding contaminated soil (extent to be defined) and to ship this to a destruction facility. The least expensive measure would be to isolate this site and secure the perimeter from further leachate movement to prevent further spread of the POPs (e.g. with glass sheets).

Solomon Islands: *Guadalcanal*
Honiara Dump site

1 2

Description:
The municipal tip for Honiara town and surrounds is located in a flat area adjacent to the Ranadi industrial area (Plate 1). This site is within 100m of the coast line.

Wastes have been set alight probably by waste pickers (Plate 2) who scavenge for a range of waste materials (e.g. metals, glass) from the extensive open dump area. The site appeared to have no site management or organisation of waste placement. A wide variety of waste types were present in the waste materials being dumped.

Clean-up result:
No clean up activities under the POPs project were undertaken at this site.

Current risks from hazardous chemicals and/or wastes:
No hazardous chemicals are officially handled at this site, although inspection of dumped waste suggests a wide range of hazardous chemicals/materials are likely to be present.

Current problems:

- The dump site suffers from a wide range of problems common to unregulated dump sites. In this case the highest concern is that the tip area is immediately adjacent to and on the flood plain of a small river close to the coast. Subsoils are likely to be saturated and leachate is highly likely to be directly seeping into adjacent waterways thence into the sea.
- While some improvements are underway under the supervision of the expatriate municipal engineer employed under NZAid (fencing, pushing waste into mounds for compaction and remediation, introducing placement protocols) relocation to a better landfill site is needed. Such a site has not been made available.

Suggested donor aid:
A long term plan is needed to put in place a series of appropriate controls to replace current practices. This will require a pre-feasibility study to scope a feasibility study with the aim of creating an integrated waste management system for Honiara.

At present these activities will have to be based using existing facilities to start the process of improvements of the entire waste management system. Possible steps forward are:

- enhanced waste avoidance and recycling;
- separate collection of organics and production of compost;
- mechanical-biological treatment of the wastes prior to landfill to reduce volumes;
- utilisation of geotextile for interim coverage instead of soil layers;
- secure funding for waste management services;
- a process for the management and destruction of hazardous materials

This will require extensive institutional strengthening through funding of the purchase and long term maintenance support for earthworks machinery, technical training in landfill management and wider training in waste management planning.