

SPREP

South Pacific Regional
Environment Programme



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File: AP 6/3/2

Tuvalu POPs Project Country Plan **(Prepared by SPREP, January 2003)**

1. Introduction

The Australian Agency for International Development (AusAID) several years ago identified the mismanagement of hazardous chemicals in the Pacific Island Countries as a serious environmental concern, and hence the Persistent Organic Pollutants in Pacific Island Countries (POPs in PICs) project was developed as an AusAID funded initiative, to be carried out by SPREP. POPs are a group of twelve particularly hazardous chemicals that have been singled out by the recent Stockholm Convention for urgent action to eliminate them from the world. They include polychlorinated biphenyls (PCBs), which are mainly found in transformers, and several pesticides that are very persistent and toxic to the environment.

Phase I of the project involved predominantly an assessment of stockpiles of waste and obsolete chemicals and identification of contaminated sites, for 13 Pacific Island Countries. Other Phase I activities included education and awareness programmes in each country and a review of relevant legislation.

Tuvalu was a participant in Phase I of this work. A comprehensive report of this Phase I work was prepared and circulated, and significant quantities of hazardous wastes were identified in the countries visited, including estimated figures of 130 tonnes of PCB liquids and 60 tonnes of pesticides (although only about 3 tonnes of POPs pesticides). Many other hazardous wastes were also identified as well. In addition, quite a large number of contaminated sites were discovered, including six locations of buried pesticides. On the basis of this report, it was decided to proceed to the Phase II of the project, which involved the preparation of a more detailed inventory, and then collecting, transporting and disposing of the wastes, to a suitable Australian facility.

The first part (Component 1) of the Phase II work is now nearly complete, and has involved visits to each of the countries involved in the project, including Tuvalu, for

detailed inventories to be carried out, including testing of all stockpiled transformers. Other work was also carried out during these visits, including improving the temporary storage arrangements where necessary, and obtaining written agreement from each country for the project to proceed. A copy of the Tuvalu visit report is contained in Appendix 1 below.

The most significant conclusion found from this next stage of the work is that the estimated amount of PCB contaminated oils was far too high. Instead of the expected 130 tonnes, only 12.5 tonnes were found. This presented an opportunity to include additional wastes in the project, and it was decided to collect and dispose of all the pesticides, rather than only the POPs pesticides (as well as all the PCB transformer oils that were confirmed positive). A total of 50,265 kg of pesticides will now be dealt with, including 1825 kg of POPs pesticides and 6542 kg of unknowns, some of which may be POPs pesticides.

A full inventory of all pesticides and PCB contaminated oils was prepared in November 2002 as the basis for bid invitations to appoint an Australian Management Contractor (AMC) to carry out the rest of the Phase II work. As a result, the Australian company GHD Pty Ltd was appointed as AMC. GHD is expected to start work shortly and it is important that all countries agree to a confirmed plan for implementing the rest of the Phase II work. The wastes will all go to the BCDT / SRL Plasma plant in Narangba, north of Brisbane.

AusAID have engaged the Australian legal firm of Blake Dawson Waldron ("**BDW**") and instructed them to provide advice in relation to aspects of the POPs Project. As part of this process BDW has asked SPREP to obtain from participating countries some information as presented in Section 4 below.

2. Country Inventory

(It is possible that more wastes may be found in the categories below, prior to the time of pickup. If so, these could be added to the inventory, subject to negotiation with AusAID and the AMC.)

Tuvalu has the following **PCB Contaminated Oils** to be collected. All 7 transformers and switchgear units stockpiled at the Tuvalu Electricity Corporation (TEC) Power Station were tested with Dexsil Chlor-N-Oil 50 test kits and 4 initially tested positive. The Dexsil kits test for all chlorine and not just chlorine in PCBs, so they are susceptible to "false positive" results. A total of one of the original 4 "positive" transformers was later confirmed as positive by Hills Laboratories in New Zealand.

Location	No of Transformers	Wt of Oil (kg)	PCB Conc (mg/kg)	No of Flushes	Total Waste Wt (incl Flushes) (kg)

Tuvalu Power	1	324	92	2	972
Station					

Tuvalu has no **Pesticides** to be collected.

3. Other Project Work

Funding was left with the Ministry of Environment, Energy and Tourism (MEET) to have all the in-service units (11 transformers and 11 switchgear units) field tested during the next long power shutdown, and then to send samples from the “positive” units to New Zealand for analysis. It is understood that the field testing was carried out, but the samples were never sent for analysis.

About 300 rusty drums of bitumen were inspected at the Public Works Department. These drums were rusted and in bad condition, and had leaked extensively, causing a large pool of bitumen. This bitumen was unsightly, a nuisance, and was probably contaminating the ground water.

The power station had six tonnes of waste oil stored in a tank at the back, and also had a large area of their ground quite badly contaminated by waste oil.

The newly refurbished hospital waste incinerator was inspected and the several aspects of operation and maintenance were found wanting.

Surplus unwanted chemicals were identified at the hospital and were reported as being stored in several schools, including the outer islands.

4. Domestic Laws on Collection, Packaging, Transportation and Export of Hazardous Waste

AusAID have engaged the Australian legal firm of Blake Dawson Waldron ("BDW") and instructed them to provide advice in relation to aspects of the POPs Project. As part of this process BDW has asked SPREP to obtain from Tuvalu (as well as all other participating countries) the following information:

- a) What are the legal responsibilities in Tuvalu for persons involved in collection, packaging, transportation and disposal of hazardous wastes and who are those responsibilities allocated to by the laws in Tuvalu.
- b) Who is the owner of the hazardous wastes in Tuvalu.

c) Does Tuvalu have domestic legislation which allocates responsibility for POPs waste during collection, packaging and export? If so, how is this responsibility allocated? Please consider that liability and responsibility may arise from:

- requirements to comply with clean-up notices or Government directions relating to the waste;
- requirements to meet safety, environmental and other standards in relation to the waste; and
- requirements to compensate others for damage to property, human health or the environment.

d) Does Tuvalu have a domestic policy in relation to providing or withholding consent under the prior informed consent provisions of the Waigani Convention (Article 6) for:

1. Tuvalu
2. any other Pacific Island Countries planning to 'transit' wastes through Tuvalu.

e) Has Tuvalu developed a national hazardous waste management strategy in accordance with Article 4(4)(e) of the Waigani Convention? If so, how is the strategy relevant to:

- the collection, packaging, transportation and exportation of POP waste; and
- responsibility for and ownership of the POP waste at each of the steps in (i).

Should you have any enquiries, please contact the following relevant Blake Dawson Waldron staff, Tony Hill on (02) 9258 6185 or Joanna Perrens on (02) 9258 6401 in Sydney, Australia.

5. Discussion

There is one transformer in Tuvalu that was confirmed positive for PCBs. This transformer contained 324 kg of oil or 380 litres at 92 mg/litre of PCBs. If it is decided to flush out the transformer and leave the carcass, then a total of 972 kg of oil plus flushing liquid will be produced, or 1144 litres. This will need a total of 6 x 200 litre drums. If it is decided to take the oil plus carcass, an even smaller space will be needed in the container.

Tuvalu has no pesticides, so there will be considerable space left in the container. To bring back any other waste would, however, need a deviation from the established AusAID policy, regarding what can be included in the project, as well as extra funding.

The total number of drums needed is therefore approximately 6 drums, so one container will be more than sufficient.

A staging location will be needed for the container, and the obvious location is the Port Harbour, as this is where the container will be picked up by the ship. It will be a simple matter to transport 6 filled drums from the TEC Power Station to the Port. The local transport of the drums needs to be on safe covered trucks with good containment. Once the container is securely packed and all the paperwork is completed, the container will be ready for shipment.

It is also important that consent procedures are in place to process the application from GHD to Tuvalu to export the waste. Tuvalu has ratified the Waigani Convention and needs to be ready to handle effectively the export application, including any appropriate public consultation processes. SPREP plans to hold a workshop soon to assist countries with this consent process.

The impact on the public in Tuvalu should be minimal, provided everything is organized and implemented according to a well-designed management plan. The local transport routes and movement times will be part of the plan, and the only risk of public exposure will be if some incident occurs during this local transport, which leads to a spill. The basis of the management plan should be communicated to the public effectively via radio, and printed media, but not in an alarmist fashion, as the risk to the public is very low.

Tuvalu has not yet signed the Letter of Agreement with SPREP for the project to proceed and this now needs to be done with urgency, if Tuvalu still wishes to be included in the project.

6. Conclusions

1. Tuvalu has one PCB contaminated transformer containing 324 kg (381 litres) of contaminated oil. Several other units have apparently been tested as positive in field tests, but samples have not yet been set for testing.
2. Tuvalu has no unwanted pesticides for disposal.
3. A total of only 6 drums will be required, which will fit easily into one 20 ft shipping container.
4. The TEC Power Station site is quite heavily contaminated with waste oil at the rear of the station.
5. The Public Works Department is heavily contaminated with 300 rusty and leaking drums of bitumen.

6. Stockpiles of used chemicals were identified in several locations, such as the main hospital and probably several schools.

7. Actions

1. Tuvalu should sign urgently the Letter of Agreement with SPREP for the project to proceed. The alternative is for Tuvalu to elect not to be part of the project.
2. The transformer for collection should be isolated and secured.
3. If the Tuvalu Government (MEET) still wishes to have the samples analysed from the “in service” transformers that tested positive, then these will need to be couriered on an urgent basis to Hill Laboratories, 1 Clyde St, Hamilton, New Zealand (ph 64/7/858-2000) with clear reference to the SPREP / AusAID project.
4. A local management plan will need to be prepared for all local operations, including the determination of the location of the container while the collection operations are going on. This plan will need to address such issues as local transportation arrangements, local contact focal point, and the best way of carrying out consultation with the Tuvalu public on the local implementation of the project. This plan needs to be developed in conjunction with the AMC.
5. Local systems need to be put in place to ensure effective processing of the application from the AMC to export hazardous waste from Tuvalu to Australia. This application will be lodged under the Waigani Convention. A SPREP workshop is planned for April to assist countries with these procedures, and a Tuvalu representative should attend this workshop. (Financial assistance will be provided.)
6. Advise TEC of the results of the PCB analyses.
7. Note the need for further investigations into the environmental impact of the waste oil contamination at the Power Station and the bitumen contamination at the Public Works Department. This should be done as soon as a suitable opportunity arises, which will probably be during the preparation of the National Implementation Plan (NIP) for the Stockholm Convention. Substantial funding is available from the GEF for the preparation of the NIP.
8. Safely stockpile all used chemicals that are not to be picked up by the current AusAID project. It would be appropriate to relocate these chemicals to the secure hazardous waste store in a part of the store with proper shelving for these chemicals, and also to ensure that proper segregation of incompatibles (e.g. acids and alkalis, oxidizers and reducers, acids and cyanides) is achieved.

9. Provide SPREP with appropriate responses to the BDW questions regarding Domestic Laws on Collection, Packaging, Transportation and Export of Hazardous Waste.

Appendix 1

REPORT OF THE VISIT OF JOHN O'GRADY (SPREP) TO TUVALU FOR THE POPS PROJECT

Thursday 4 April

Flew from Suva to Funafuti, Tuvalu.

Met *counterpart Kelesoma Saloa* was introduced to the Waste Management Project and team. Had meeting and discussed the aims of my visit. Was given a tour of Fongafale Island.

Friday 5 April

Met with *Mataio Tekenene, Acting Secretary, Ministry of Environment, Energy and Tourism (MEET)*. Mataio explained that the SPREP Letter of Agreement would need Cabinet approval. Mataio asked that JOG write cabinet papers: accompanying the LOA, and also for signing the Stockholm Convention.

Wrote Cabinet Paper for Stockholm Convention signature.

Met *Ms Hellani Tumua, Tuvalu AusAID Administrative Officer*, and discussed the POPS in PICs project. Also discussed AusAID's role in general in Tuvalu.

Met with Tuvalu Electricity Corporation (TEC) staff– *Mafalu Lotolua, Operations Manager and Fatoga Talama, Maintenance Supervisor (Ph 20357, Fax 20351)* – discussed PCB testing, waste oil, and oil contamination, and inspected the site, including the waste contamination, which was widespread and messy. TEC also have about 6 tonnes of waste oil stored at the power station site, which they say they currently have no solution for disposal. It was suggested that the in-service transformers could be tested over the weekend when the power could be turned off segment by segment for a few minutes at a time to take and test samples. The TEC General Manager said, however, that more time was needed to warn residents that these shutdowns would be occurring. It was proposed that this work could be carried out at a later date.

Met *Filipo Taurima, Director, Public Works Department*, and discussed the cleanup of bitumen wastes. Filippo explained that the waste bitumen was left by the US Army Corps of Engineers when they built the main road network about a decade ago (or longer?) Apparently they did a poor job of the road construction, took many shortcuts, ignored the New Zealand engineer who was there to represent Tuvalu and who kept complaining, and ended up just abandoning the bitumen they didn't (but should have) used. Now it is a major problem. The 300 drums have all rusted, and the bitumen has spilled out all around the drums and the surrounding area. The leaked bitumen has a hard skin, but is

tacky underneath this skin, and melts easily to become sticky and is very hard to handle. It probably is not moving much into the groundwater as it is so viscous, so its worst impact may be that it is making an area of land unusable in a country where land is very precious. It does represent a continuing potential source of groundwater pollution, however.

Monday 8 April

Wrote Cabinet Paper regarding the LOA and had further meeting with Mataio, who promised that he would try to get the LOA signed before JOG left on Thursday.

Visited *Vete Sakaio, Manager BP Fuel Depot*. The site was clean and tidy, and appeared well organized. Vete confirmed that oil slops from the site were intercepted in their three-stage interceptor and collected for shipment to Fiji for disposal. He also said that all their tank-cleaning sludges were returned to Fiji for disposal. He also said that BP was concerned about the TEC contaminating their power station sites with waste oil, and that it was just poor management. He said that they have advised TEC many times that they would take back all their waste oil for shipment back to Fiji, provided it was returned in secure containers such as sound sealed drums.

Vete also had a solution for the waste bitumen, which he said that BP would assist with, even though it was not their problem. If it was drummed in open-topped drums and sealed, the drums could then be taken, a few at a time, out to sea on board one of the two Tuvalu Government owned vessels that were fitted with cranes, and the drums would then be dropped overboard into deep water. This is a pragmatic solution which would be much preferable to the existing situation, but it is likely that international marine dumping laws would be infringed.

Vete P. Sakaio
BP Depot Manager
Ph: 20745, 20760,
Fax: 20761
swptvmgr@tuvalu.tv

Visited *Tavau Teii, Director of Agriculture*, and discussed whether the Dept of Agriculture had any stockpiles of pesticides or other wastes which needed removal. Tavau said that there were no stockpiles of pesticides in Tuvalu. The small quantities listed in the SPREP Phase I report had all been used up, and no more had been imported. The Dept of Agriculture was the only legal importer of pesticides and fertilizers, and seldom imported any of either. Locals were not able to use pesticides and were encouraged to use compost and livestock manures.

The only stockpile still remaining from the SPREP Phase I work was the one tonne of potassium chloride, which could surely be dumped in the sea if they really wanted to get rid of it. It probably could also go into the new landfill. The superphosphate mentioned in the SPREP Phase I report has all been used.

Tavau Teii
Director of Agriculture
Ph: 20825
Fax: 20826
agricola@tuvalu.tv

Visited **David Manuella, Director of Education (ph 20407)**. David advised that the Maritime School on Amatuku is no longer under their control, and TEC is now the agency to see about the oil contamination at the power stations at both the Maritime School and the secondary school on Vaitupu. David thought there might be some surplus laboratory chemicals at the secondary school, but he wasn't sure. He said they did have problems with waste disposal at the secondary school and asked if the Waste Management Project could help him. (JOG later checked with Kelesoma and he said that at present the project did not extend to the outer islands.)

Inspected with Kelesoma, the **medical waste incinerator at the hospital**. It was operating, and they had a policy of turning it on every day after school as it was very close to the school. It was an old unit supplied by the British 10-15 years ago, which had never been commissioned. As part of the AusAID Waste Management Project, it had been fitted with new burners and controls and commissioned. The fuel system was also changed from gas to diesel. When JOG arrived, the primary chamber was operating at 614⁰C and the secondary at 780⁰C, and the system was stable with no visible smoke. JOG was told that the capacity of the system was only 6 kg per charge. JOG was then surprised to see the operator (wearing shorts and jandals) open the primary chamber door and kick in quite a large amount of waste. Black smoke immediately poured out of the stack, and the resulting positive pressure in the incinerator caused black smoke to blow out around the door. It must be a common occurrence, as when JOG protested, the operators seemed unconcerned. JOG will follow up, and will check operational procedures.

Went back to TEC and tested two switchgear units (both positive) and one transformer (negative.) I also advised TEC that BP will take back their oil free of charge. Kelesoma has empty drums from the incinerator fuel, which he will supply to TEC free of charge.

Tuesday 9 April

Spent the morning and part of the afternoon reviewing, at the request of Mataio Tekenene, **the AusAID Waste Management Project**, and was impressed. The following are the highlights:

- Under the difficult circumstances a reasonable attempt to set up a small landfill operation in one of the borrow pits
- A well run and successful composting operation with weekly collection of household green waste. I witnessed the compost being collected, shredded and turned, and the aged compost appeared to be of good quality. Some of it was used

for cover material at the landfill, but quite a lot was being purchased by residents (\$2/wheelie bin) for garden use – a welcome product in a soil-poor community.

- Separate collections of aluminium cans and car batteries.
- A model piggery operation was being established
- All food scraps were now being fed to pigs (a good way to recycle them)
- A good hazardous waste store.
- A regular (once weekly) island-wide garbage collection, using wheelie bins and larger one cubic meter mobile bins (on trailers pulled by tractors) for pickup.
- One compost toilet, which had been set up as a trial.
- 18 school and 20 public toilets using septic tanks had been built.

Still needing action were:

- The efficient operation of the medical incinerator as described above.
- Legislative support had been promised for all these initiatives but had not happened.
- The aluminium can crusher still operated poorly.
- The PDD Component 3 work on “Wastewater Management” still needed work. No wastewater management strategy had been developed, improved septic tank system trials had not happened, and only one instead of the promised five compost toilets had been built, although as noted above, school and public toilets had been built.
- Despite being covered by the PDD, no system of waste oil collection had been set up, which was surprising, given BP’s willingness to participate in such a scheme and pay for shipping the oil back to Fiji for disposal.

AusAID support for the project due to end in June and some of these outstanding matters may still be sorted out. There was, however, widespread concern that once everything was handed over to the Funafuti Town Council, the initiative of the project would be lost. Maybe AusAID should stay involved at least to some degree?

The rest of the day was spent on testing the remaining stockpiled old transformers at the **TEC Power Station**. Four more units were tested and two gave positive results. The total volume of oil (so far) in the units tested positive was 878 litres or about 800 kg.

It was agreed that all the in-service units (11 transformers and 11 switchgear units) would be tested during a public holiday in May, when a long shutdown was planned in order to install a new 750 kVA main supply transformer. Kelesoma and Fatoga have now been trained to do this testing work.

Wednesday 10 April

Met **Dr Tekaii Nelesone of Ministry of Health**. (Ph no: 20480 or 20482). Described the POPs in PICs project to Dr Nelesone and discussed the health significance. Then discussed the medical waste incinerator and the importance of good management and

maintenance when the MOH take over the incinerator. Also asked about the surplus laboratory chemicals that may be stored at the Hospital.

At Dr Nelesone's introduction, then visited the ***Princess Margaret Hospital and met Faiatea Latasi, the Laboratory Supervisor***. There are probably about 20 kg of surplus chemicals stored at the hospital, including sodium oxalate, potassium ferricyanide, potassium cyanide, potassium dichromate, caustic soda, and small quantities of concentrated sulphuric and hydrochloric acid. Arrangements were made to transfer all these surplus chemicals to the Waste Management Project's hazardous waste store.

Met with ***Thomas Tafia, General Manager of the Tuvalu Electric Corporation***, and explained the results of the PCB tests, and the hazards presented by PCB's to the TEC staff and the environment. Also thanked Mr Tafia for his cooperation, including agreeing to allow the "in-service" PCBs to be tested during the next major shut-down planned for May. Mr Tafia expressed his willingness to cooperate, but he had serious concerns about the cost of replacing any transformers confirmed as PCB-positive, which were still usable. I explained that the decision to remove such transformers was their decision, and all we would do was advise them of the results of the testing and offer to take away the ones confirmed as positive.

Had a de-briefing session with ***Mataio Tekenene of MEET***. Mataio agreed to get the LOA signed and sent to SPREP as soon as possible. JOG also stressed with Mataio, the need for Tuvalu to sign the Stockholm Convention on an urgent basis, in order to be able to easily take advantage of the funds available from the GEF for preparing National Implementation Plans.

Then met ***Paani Laupepe, Deputy Director of MEET***, also for a de-briefing session. Paani was concerned about the sustainability of the waste management project and asked if SPREP could help. JOG advised him that he could apply for some funding under the SPREP "small grants scheme", to assist with the transition arrangements. JOG indicated that there may be about \$US5000 available. Paani also expressed the wish to undertake a "Beautification Project" for Tuvalu, including full and continued implementation of the Waste Management Project, removal of all old vehicles, removal of the waste bitumen and hazardous wastes, and selective planting of attractive trees and shrubs.

Re-visited the ***incinerator with Susan Lautopa of the Waste Management Project***. Susan had prepared a set of easily-read instructions to display on the wall of the incinerator shed. We noted several further matters of concern. The gap between the roof opening and the stack easily permitted rain to fall on the incinerator, allowing corrosion to occur. This was of particular concern with the burners, where significant corrosion was already evident. In addition, a control box cover on the secondary burner was missing and a temporary repair to the controls had been made (poking a stick into the controller).