

SPREP

South Pacific Regional
Environment Programme



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File: AP 6/3/2

Vanuatu 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.

Vanuatu 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 of the Phase II work is now nearly complete, and has involved visits to each of the countries involved in the project, including Vanuatu, 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 Vanuatu 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.)

Vanuatu has the following **PCB Contaminated Oils** to be collected. All stockpiled transformers were tested with Dexsil Chlor-N-Oil 50 test kits and 36 initially tested positive out of 85 transformers (stockpiled at the UNELCO Depots in Port Vila and Santo, as well as opposite the UNELCO Depot at Port Vila). The Dexsil kits test for all chlorine and not just chlorine in PCBs, so they are susceptible to "false positive" results. A total of 19 of the original 36 transformers were later confirmed as positive by Hills Laboratories in New Zealand.

Location	Transformer	Wt of Oil	PCB Conc	No of	Total Waste Wt
	ID Number	(kg)	(mg/kg)	Flushes	(incl Flushes) (kg)
UNELCO Depot	VP4	64	4570	Remove transformer	64

Port Vila	VP10	245	21	2	735
	VP14	136	54	2	408
	VP21	107	181	3	428
	VP24	180	1050	4	900
	VP28	204	952	4	1020
	VP31	114	36	2	342
	VP32	175	33	2	525
	VP45	48	112	3	192
	52P	294	8380	Remove transformer	294
	VP56	97	229	3	388
	VP57	159	476000	Remove transformer	159
	VP58	86	160	3	344
	VP60	306	868	4	1530
	VP61	104	213	3	416
	VP63	72	143	3	288
	VP64	342	100	3	1368
UNELCO Depot	VP80	90	2680	Remove transformer	90
Espiritu Santo	VP83	359	76	2	1077

Vanuatu has the following **Pesticides** to be collected:

Location	Pesticide	Active Agent	Quantity	Comments
			Kg	
Vector borne Shed Port Vila	Aqua resigen		443	Liquid, Expired, (They may still use this)
	DDT		12	Solids in small bags
	Malathion 57%		108	Was brought in 1998 but not used up to date.
	Aquapel		302	Liquid
Former Squash farm container 1	Benlate		80	
	Unknown (Kopi ?)		15	Green granules
	Unknown		180	Blue drum partially rusted, BASF chemical
Former Squash farm container 2	Fertilon Combi-green		300	
	Ridomil		100	
	Maneb		50	
	Topas 10 WP		10	
	Linuron 50DF	Methiocarb	12.5	
Quarantine Treatment Centre	Garden Master		2	
Port Vila	Thiram		2	
	Thiodan 35EC		1	Liquid

	Methyl bromide	Methyl bromide		10 empty cylinders
Chapuis Research Station Shed	Aliette	74% Fosetyl	21	
	Dithane M-45		26	
	Difolatan		8	
	Lindane		50	Bags in poor condition
	Borax		150	
	Methyl bromide	Methyl bromide		13 empty cylinders
Chapuis Research Station	Gramoxone	Paraquat	5	Liquid
Old Shed	Dicidex	Trichlorfon	1	Liquid
	Dimethoate 40%		10	Liquid
	2-4-D		5	Liquid
	Lindane 16%		1	Liquid
	Unknown Nufarm chemical		8	
	Lepidex		45	Liquid
	Ambush		2	
	Unknown		5	20 litre white containers
	Lepidex			24 empty 5-litre containers on the floor
	Dicidex			6 empty 1-litre containers on the floor
Quarantine Storage shed	Dichlorvos 100E		5	Liquid
Luganville	Maldison		0.5	Liquid
	Garden Master	Mixture	0.2	
	Mancozeb		0.2	
	Captan		0.1	
	Carbaryl		0.1	
	Glyphosate CT 45%		18	Liquid
	Copper hydroxide		0.2	
	Methyl bromide			3 empty cylinders
SANMA Provincial Vector-Borne	DDT, 75% wettable powder		577	
New Storage Shed, Luganville				
SANMA Provincial Vector-Borne	DDT, 75% wettable powder		15	
Old Storage Luganville hospital				
Isangel Agriculture Station	Glyphosate 360		5	Liquid
Tanna	Tordon 50-D		5	Liquid,
	Dicidex		3	Liquid
	Unknown		3	In white 5 litre container
	Unknown		9	In white 5 litre container
	Lepidex		2	Liquid
	Urea		300	
	Unknown		1350	Green stripe marking

3. Other Project Work

A composite sample of soil was taken from the vacant area over the road from the UNELCO depot at Port Vila. A total of 17 transformers at this location were confirmed as containing PCB contaminated oil, including one containing pure askarel (47.6% PCBs). Analysis of this soil sample revealed a positive but low level of PCBs, i.e. 22.1 mg/kg dry weight of total PCBs. It would therefore be prudent to remove at least 5 cubic meters of soil from the surface of this site.

Stockpiles of other hazardous wastes besides POPs and pesticides were also investigated. Surplus chemicals were noted at the main hospital at Port Vila and reports were received of other stockpiles at schools and other hospitals.

Several timber treatment plants were visited and two had stockpiles of CCA that need to be dealt with. There is a plant at Teoma near Port Vila that has been abandoned, together with a large timber milling facility. About 65 tonnes of dilute CCA is stored in a treatment tank, and there are several vessels with smaller amounts of concentrated CCA. The other plant of concern is the Santo Veneer plant at Luganville, which is still operating but has an abandoned timber treatment facility with about 69 tonnes in total of dilute CCA and some concentrated CCA. They also have about 2400 litres of drummed unused treatment chemical (sodium borate and tanalith).

One plant that was inspected for surplus chemicals had dumped them in an onsite pit. This was the Vanuatu Coconut Products plant at Luganville, and the on-site pit is a real concern. It is unfenced, smelly and bubbling with gases (probably methane from anaerobic digestion).

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 Vanuatu (as well as all other participating countries) the following information:

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

- c) Does Vanuatu 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 Vanuatu have a domestic policy in relation to providing or withholding consent under the prior informed consent provisions of the Waigani Convention (Article 6) for:
- Vanuatu
 - any other Pacific Island Countries planning to 'transit' wastes through Vanuatu.
- e) Has Vanuatu 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

A total of 19 transformers have been positively identified as containing PCB contaminated oil, and 17 of these transformers are located with the large pile of obsolete transformers stored on vacant ground along the road opposite the UNELCO depot at Port Vila. As shown above, one of these transformers contains pure askarel at 47.6% PCB. In addition, the soil underneath these transformers is contaminated, albeit at a low level. Analysis of a composite soil sample revealed 22.1 mg/kg dry weight of total PCBs. It would therefore be prudent to remove about 5 cubic meters of soil from the surface of this site, and possibly more. It may be necessary to carry out more analyses of the soil on this site, due to the fact that a pure askarel transformer is stored there. This transformer was not full so some askarel had leaked out, though not necessarily on that site.

Due to the potential for contamination at the site, the best temporary measures to take would be to fence off all the stockpiled transformers and erect warning signs instructing the public to keep out. People living near the stockpiled transformers should be fully briefed about the need not to enter the potentially contaminated area. They have also established a garden right next to the area and this garden should be abandoned.

The other two “positive” transformers are stored at the UNELCO Depot at Luganville. These transformers should be set aside and clearly marked, as there may be potential for reuse of these transformers.

The pesticides stored at the vector borne shed at Port Vila are in good condition and some may still be used, especially the aqua resigen.

The pesticides stored at the former squash farm are in two containers. There are two other containers stored there but they do not contain pesticides. The entrances to containers with the pesticides were chained up during the recent visit. The pesticides are in quite a bad condition with packaging damaged and some labels missing. There are also large quantities of fertilizers in the two containers, and some mixing has taken place between the fertilizers and the pesticides.

The quarantine treatment centre at Port Vila contains a small amount of surplus pesticides as well as 10 empty cylinders of methyl bromide.

At Luganville the old Chapius Research Station has two sheds containing some old pesticides. The newer shed has about 255 kg and they are in poor condition although the shed is in good condition. The old shed is in poor condition and leaking. There are about 82 kg of pesticides stored there and a larger amount of pesticides spilled on the floor and around the shed.

Two SANMA storage locations at Luganville contain DDT stockpiles. The new storage shed has 577 kg stored securely and in good condition. The old storage shed at the hospital has about 15 kg stored, together with some spilled on the floor. This shed had a further 300 kg approximately, that had been dumped in an unknown location. The quarantine store at Luganville has a small quantity of surplus pesticides stored (about 24 kg), plus 3 empty cylinders of methyl bromide.

The Isangel Agricultural Station at Tanna has about 1677 kg stored in reasonable condition, but with a large amount of unknowns.

It has been suggested that the best way to remove the PCB contaminated oils from the transformers would be to flush the transformers with a suitable solvent such as kerosene. An estimate of the number of flushes required is given in the PCB Table above, and if this method is used, this would mean a total of 10,658 kg (or about 12,500 litres) of contaminated oil and solvent would need to be transported. This would require 63 x 200 litre drums. The alternative to solvent flushing is to take the complete transformers

(contaminated oil plus carcasses), but then the oil will need to be drained out of the carcass and transported separately. Four of the transformers (VP4, 52P and VP57 at Port Vila, and VP80 at Luganville) should not be flushed anyway and should just be drained with both the drained liquids and the transformers shipped for disposal. This will contribute another 607 kg or about 700 litres of liquid, requiring 4 more 200 litre drums, plus the volume of the transformers.

If 5 cubic meters of PCB contaminated soil is removed from the UNELCO storage site in Port Vila, then this would require about 25 x 200 litre drums.

There is about 4250 kg of various pesticides to be transported. Allowing for packaging, absorbent and the possible need for segregation, these pesticides would probably require about 40 x 200 litre drums.

The total number of drums needed is therefore 132 drums (approximately) plus the 4 transformer carcasses. A total of 80 drums will fit inside a 20 ft container, so at least two 20 ft containers will be required for Vanuatu, and possibly an extra one, depending on the quantity of soil to be removed from the UNELCO Port Vila site.

A staging location will be needed for the containers, possibly on an area of land controlled by either the Environment Unit or the Department of Agriculture (Quarantine) as it is understood that they will be the joint focal point agencies in Vanuatu for the project. The filled drums will then be transported there from the various stockpiles in Port Vila, Luganville and Tanna, and all packed securely into the containers according to international shipping requirements.

The local transport of the drums needs to be on safe covered trucks with good containment. Once the containers are securely packed and all the paperwork is completed, the containers will be transported to the Port for shipment.

It is also important that consent procedures are in place to process the application from GHD to the Government of Vanuatu to export the waste. Vanuatu has not ratified the Waigani Convention, so preferably that Convention should be signed as soon as possible, in order to enable easier processing of the consent application. Otherwise a bilateral agreement will be needed directly between the Governments of Vanuatu and Australia. SPREP plans to hold a workshop soon to assist countries with this consent process.

Vanuatu has not yet signed the Letter of Agreement with SPREP for the project to proceed and this now needs to be done with urgency.

The impact on the public in Vanuatu 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

TV, radio, and printed media, but not in an alarmist fashion, as the risk to the public is very low.

6. Conclusions

1. Vanuatu has 19 PCB contaminated transformers containing in total about 3182 kg of contaminated oil (about 3750 litres). One of these transformers contains pure askarel (47.6% PCB). If solvent flushing is used to remove all the contaminated oil, this will mean there will be about 12,500 litres of contaminated oil and solvent to be removed, as well as 4 transformer carcasses and about 700 litres of drained oil.
2. The soil at the UNELCO Port Vila transformer stockpile storage yard is also contaminated and some soil will need to be removed. It is likely that more soil sampling and analysis will be needed.
3. About 4250 kg of pesticides will need to be picked up, from various locations in Port Vila and Luganville. This includes 604 kg of POPs pesticides (DDT).
4. At least 5 cubic meters of contaminated soil will also need to be removed from under the transformers at the UNELCO Port Vila transformer stockpile storage yard, and possibly quite a bit more than this amount.
5. A total of at least 132 drums will be required if the transformers (suitable for flushing) are flushed. If not, the number of drums will be smaller and the transformer carcasses will also be shipped. All the wastes should be able to be managed in two containers if the amount of soil to be removed from the UNELCO Port Vila site is around 5 cubic meters. Otherwise three containers (or possibly more) will be needed.
6. Some stockpiles of used chemicals (not pesticides) were found in various locations, especially the main hospital at Port Vila.
7. Large stockpiles of CCA timber treatment chemicals at two locations (Teoma, Port Vila, and Santo Veneer Plant, Luganville) are of concern, as well as 2400 litres of unused timber treatment chemical at the Santo Veneer plant.
8. The on-site disposal pit at the Vanuatu Coconut Products plant at Luganville is of concern, both from an environmental and a public safety point of view.

7. Actions

1. All the transformers and contaminated ground at the UNELCO Port Vila transformer stockpile storage yard should be fenced off and signposted with warning signs.
2. The neighbour's garden next to the UNELCO Port Vila transformer stockpile storage yard should not be used any further and the neighbours should be formally advised.
3. The two PCB contaminated transformers at the UNELCO storage site at Luganville should be separated out and kept secure until pickup can be arranged.
4. All the pesticides in the various locations in Port Vila and Luganville should be isolated and secured. It needs to be confirmed with the owners / managers that these pesticides are definitely to be removed as part of the project. (For example, some of the pesticides at the Vector-borne Shed at Port Vila may still be used.)
5. 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 Vanuatu public on the local implementation of the project. This plan needs to be developed in conjunction with the AMC.
6. Local systems need to be put in place to ensure effective processing of the application from the AMC to export hazardous waste from Vanuatu to Australia. This application will be lodged under the Waigani Convention if possible, so every effort should be made to ensure Vanuatu signs the Waigani Convention in time. If not, bilateral arrangements will be needed, between the Governments of Vanuatu and Australia. A SPREP workshop is planned for April this year to assist countries with these procedures, and a representative from Vanuatu should attend this workshop. (Financial assistance will be provided.)
7. Efforts should be made to encourage the reuse within Vanuatu of the CCA and treatment chemicals at Teoma and Santo Veneer. There are several other timber treatment operations in Vanuatu that may be interested.
8. The onsite pit at the Vanuatu Coconut Products plant at Luganville should be fenced off with a high security fence and assistance should be given to the plant to rehabilitate the site and stop using it for dumping wastes.
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 AND MELCHIOR MATAKI TO VANUATU FOR THE POPS PROJECT

Friday 15 November 2002

In Vanuatu the POPS project is a joint one between the Environment Unit and the Department of Quarantine. We met first with *Mr. Russell Nari and Mr. Trinison Tari (both Environment Officers)* and briefed them about the project, although the details of our visit were sent over initially to their Director who was away in one of the islands. We later met *Mr. Tekon Timothy Tumukon (Principal Plant Protection Officer)*, who was our co-counterpart and we had a joint briefing with **Mr. Trinison Tari**.

We then met *Mr. Morris Amos (Acting Manager, Malaria & other Vector Borne Diseases Control Program)* and briefed him about the project and its implications for the various pesticides they may be using in the anti-malaria and other vector borne diseases program. He told us that they have banned DDT (for about 10 years to date) and large shipment of DDT was sent to Papua New Guinea in 1997. However, they use other pesticides, which included malathion and other permethrin formulated products (see the attached inventory for details). We inspected their storage shed and found a few kilograms of DDT, more than 10 cartons of expired aqua-resigen and a stockpile of malathion, which was brought in 1998 but had not been used to date.

We also visited two shipping containers located on a former squash farm at Teouma outside of Port Vila. Both containers had less than 5 different pesticides (in small quantities) and several tonnes of fertilizers (see attached inventory for details). A caretaker family lived about 20 metres from these two containers and the two containers were readily accessible to them and others. We also gathered from the caretakers that a number of bags (pesticide or fertilizer?) had been removed by some people in the past.

We visited the former timber treatment facility of the Pacific Veneer at Teouma under the guidance of *Mr. Rony Wisyl (Security Officer)*. Two tanks held CCA with one of them having pure CCA chemical (probably about one tonne) after the evaporation of water. The tank outside the shed has the liquid CCA and it held about 65,500 litres. The horizontal treatment pressure vessel was also lined with CCA residue. The treatment plant hasn't been in operation since 1993.

Monday 18 November

We first visited *UNELCO (Electricity and Water Suppliers)* and met *Mr. Yvonnick Raffin (Managing Director)* and *Mr. Pascal Louvet (Electricity Supply Manager)*. We gave them a briefing about the project and its implications on PCBs in transformers. All the transformers they use throughout the country are brought into Port Vila when they need servicing, so we were advised there were no old transformers in Santo or elsewhere.

Furthermore, unlike in the past, when their waste oil (including transformer oil) was sent to Fletcher Steel Ltd in Fiji, nowadays, the waste oil is sent to the Nickel mine in New Caledonia. Although, an appointment was made last week for the testing of transformers, they would not allow us to test the transformers today. A further appointment was therefore made for tomorrow.

We could not meet **Mr. Ernest Bani (Head of Environment Unit)** last week and so we next visited him to brief him on the project and to give him the LOA. We also stressed to him the need for Vanuatu to ratify the Waigani Convention, which would greatly smooth the consents for the later stage of this project. He explained that the ratification of any convention has to go through the Parliament and this explains the delay to date in the ratification of the Waigani Convention and the Basel Convention. On the other hand, the Stockholm convention had been ratified already. Furthermore, he could not sign the LOA because; it has to be processed through the Vanuatu State Law Office. He promised to send it to SPREP when it had been processed. John O'Grady promised that night to prepare background reports for both the LOA and the Waigani Convention. We also used the opportunity seek Ernest Bani's approval to let Trinision accompany us during our visits in Port Vila and to the Islands of Tanna and Malakula.

Trinision took us to the Freshwater former dump, which was very close to residential areas and a secondary school. The site had been over-grown with shrubs as well a bananas, a shack was built on the site and a family inhabited it.

We then paid visits to the following commercial dealers:

Mr. Allan Sands (Managing Director, Vanuatu Agriculture Supplies)

Mr. Michael Leo Callanan (General Manager, Pacific Suppliers Ltd)

Mr. Philippe ? (Ezykill Pesticides)

None of them had any expired chemicals and they generally only order small quantities of chemicals. **Michael Callanan** also offered to take in any of the excess mineral acids identified in this project, as they used such acids regularly. He went further, to let us know that, two mining companies in PNG may be interested in buying the mineral acids.

We then visited the Quarantine Treatment Centre and were assisted by our local counterpart in that Department, Tekon Timothy. They only had a few expired pesticides in small quantities and 11 empty cylinders of Methyl bromide (see the attached inventory for details).

We closed our visits for the day by inspecting the Medical Laboratory of the Port Vila Central Hospital under the guidance of **Mrs. Hellen Wamle** (Principal Laboratory Officer). They had had some expired chemicals that were hard to get to because the storeroom was crowded. A detailed inventory of the chemicals will be made upon our return from Santo at the end of the week.

Tuesday 19 November

We tested 60 transformers today with the good assistance from 3 staff members of UNELCO. 25 transformers gave positive results for PCB with one giving a positive test as being pure Askarel (the first so far in this project). The nameplate confirmed that it contains pure Askarel, and a sample was obtained for further testing. All transformers at the site were clearly labelled with a marker and spray paint and dual samples were collected from each transformer that tested positive. A composite soil sample was also taken for PCB testing. The transformer that tested positive as pure askarel was covered with two tarpaulins and secured with a chain and padlock, the keys were given to UNELCO.

The transformers are kept in a UNELCO piece of land that was openly accessible to the public. A residential home was only a few metres from the site and the residents planted root crops and vegetables within the area the transformers were kept. Given the high number of positive cases for PCB and the existence of a transformer containing pure askarel, we have asked the residents not to plant within the area and not to eat the current root crops and vegetables on the site.

Wednesday 20 November

We continued with transformer testing today at the UNELCO workshop area. We tested 13 transformers and a drum of transformer oil, with 7 testing positive for PCB including the drum of transformer oil. The oil samples and soil sample from yesterday and today were sent via courier today. We also went to the former squash farm and secured the two containers with chains and padlocks.

We then flew to Espirito Santo together with Tekon Timothy to continue our work there.

Thursday 21 November

We met **Mr. Peter Malisa (SANMA Provincial Vector-Borne Disease Supervisor)** and he took us to the new storage shed. **Tekon** and two other Quarantine officers accompanied us. In the storage shed was about 600 kg (in 16 full boxes and 1 half filled with 1 kg packets) of DDT initially identified in the first phase of the project, the balance of about 300kg was apparently left at the old storage shed near Luganville hospital. A preliminary check on the old storage shed confirmed the presence of the DDT, but we could not get in because the officer with the key was not present. The new storage shed was secure and also contained other pesticides (similar to the ones seen at the Port Vila Vector-Borne Storage Shed). Two of the boxes containing DDT were broken and DDT spilled out of one.

Since we were with 3 Quarantine officers, we went to the former Chapius Agriculture Research Station. In one of the sheds we found 5 different pesticides in small quantities (see the attached inventory for details), 13 empty cylinders of Methyl bromide and about

200 tonnes of fertilizers. The room was openly accessible to the public and was littered with spray equipment, a defunct fumigation unit and two engine blocks. In a very old shed about 500 metres from the previous shed, there were 7 different pesticides (see the attached inventory for details). Part of the shelves that used to hold the pesticides (mostly liquids) had collapsed and a significant number of the liquid pesticides fell and spilled on the floor. The roof of the shed was partially missing and the whole structure was in a poor state of disrepair.

We went to Vanuatu Coconut Products Ltd, which was involved in the manufacture of soap and met **Mr. Barry Vigouroux (Acting General Manager)**. We toured the factory, and there were no stockpiles of chemicals, although the stockpile of aluminium sulfide identified in the first phase of the project had been burnt in a pit within the factory compound. At the time of the visit, the pit was full of water and it was evident that solid waste from the factory was also dumped into the pit. It was like a black cesspool, and was emitting gases from the anaerobic digestion taking place.

We visited the Luganville Landfill and observed the generally poor state of this landfill. There was little evidence of covering done and as with most of the landfills in the South Pacific, it received all types of waste and burning was used as a means to reduce the level of solid waste. Although the landfill was quite far out of town and fenced, it was adjacent to cattle farms.

We closed our activities for the day by inspecting the Quarantine storage shed at the wharf. It contained 9 different obsolete pesticides in small quantities including 3 cylinders of Methyl bromide. There were also other pesticides, which were currently used in their work programs.

Friday 22 November

We visited the Santo Veneer timber treatment plant under the guidance of **Mr. John Ling (Camp Manager)**. According to Mr Ling, the pressurised CCA treatment facility has not been used for over two years. The treatment plant consisted of 2 wooden tanks (3M diameter x 4M height) lined with high-density plastic containing about 21,000 litres of CCA, and a smaller tank had almost pure CCA sludge at the bottom. A steel tank used for preparing CCA had some liquid CCA at the bottom. Adjacent to the tanks was the waste CCA pond (20M x 3M x 0.8M) containing about 48 cubic metres of waste CCA. The site was also evidently contaminated with CCA. It is also worth noting that in the first phase report, it stated the existence of concrete tanks that were non-existent on site.

The company also had 1600 litres of Diffusol (454g/l boric acid, 225g/l sodium borate and 1.1g/l octhilimone) in 8 by 200 litre plastic containers. In addition to this, they also have 800 litres of Tanalith (221g/l CCA) in 4 by 200 litre plastic containers. Both chemicals are for timber treatment and they will not be using these chemicals. They are stored in a building 20 metres away from the treatment plant. We advised the Camp Manager to consider reselling both chemicals to other timber treatment operators in Santo or elsewhere.

We paid a visit to the Forestry Department and met **Mr. Dick Tomker (Regional Forest Officer Northern)**. He told us that they do not have any stock piles of pesticides, and furthermore, he could not verify the existence of an illegal timber treatment plant west of Luganville that was referred to in the first phase report.

We went to the Forest Products Ltd sawmill and inspected its pressured timber treatment facility with the assistance from **Douglas John (Treatment plant Operator)** and **Jacob Herison (Supervisor)**. The plant was a bit old but operational and the CCA wastes were contained in a pond with a volume of about 60 cubic metres. We pressed further and visited **Triwood Industries** and met **Mr. Richard Nutley (Manager)**. They have a fairly new timber treatment plant and had a contained drainage system for CCA waste. We also visited **Melcoffee Sawmill Ltd** and met **Mr. Neil Croucher (Managing Director)**. They also have a pressured timber treatment plant. All their CCA wastes were shipped overseas for reprocessing.

Although the UNELCO Head Office in Port Vila told us that old transformers in Santo have been sent over to them, we paid the UNELCO facilities in Luganville a visit with assistance from **Mr. Stephane Garlopeau (Area Manager-Santo)**. They in fact had 6 old transformers, we only tested five of them (we only had 5 Test kits) and two gave positive results for PCB (oil samples were collected). We collected a sample for the 6th transformer and also noted that they have 5 new PCB free transformers.

We made a second visit to the old Vector-Borne Disease Control storage shed at Luganville hospital to verify the existence of the rest of the DDT initially identified in the first phase report. There was about 10 kg of DDT in a 200-litre steel drum. There was also evidence of DDT contamination within the room. Given the time constraint we had in respect of our flight back to Port Vila, we gave Peter Malisa some cleaning implements and safety gear to clean the room of DDT and place all residues into the steel drum. It is now apparent that about 300kg of the original DDT kept in the old storage shed had been dumped but the officers on site could not verify the actual site where the dumping took place.

Saturday 23 November

John O'Grady flew back to Apia, and Melchior Mataka stayed on in Vanuatu for two further visits to the islands of Tanna and Malakula. He subsequently found 1350 kg of surplus pesticides at the Isangel Agriculture Station at Tanna. He also visited the main hospital at Port Vila and noted numerous surplus chemicals stored there.