National Implementation Plan for the Management of Persistent Organic Pollutants

Commonwealth of Dominica

Prepared by the Environmental Coordinating Unit (2006)

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EXECUTIVE SUMMARY

INTRODUCTION

The Commonwealth of Dominica acceded to the Stockholm Convention on Persistent Organic Pollutants on 8 August 2003. This Convention aims to protect human health and the environment from Persistent Organic Pollutants, and initially targets 12 chemicals known as the "Dirty Dozen". These chemicals have been traditionally used in agriculture, industry and vector control sectors.

As Party to the Convention, Dominica is in a better position to prevent entry through trade of these products and to monitor their movement within Dominica. As a first step towards implementation of the Convention, Dominica has prepared a National Implementation Plan. To develop the National Implementation Plan, the Government of Dominica secured assistance from the Global Environment Facility, through the United Nations Environment Programme. The Enabling Project Activity process provided an opportunity for Dominica to undertake a preliminary assessment of the existing use of Persistent Organic Pollutants, to determine the capacity to manage these chemicals, and to fulfill its obligations under the Stockholm Convention.

The specific objectives of the Enabling Activity Project were to undertake:

- An assessment of the existing legal and institutional framework;
- An assessment of existing capacity to implement the Convention and level of awareness on Persistent Organic Pollutant issues;
- An inventory of existing or obsolete Persistent Organic Pollutants and related chemicals;
- An assessment of the socioeconomic, health and environmental implications of Persistent Organic Pollutants and related chemicals;
- The development of an information system (database) and website;
- The development of a national chemicals profile and determination of objectives and priorities for sustainable chemicals management in Dominica.

In order to ensure an effective and successful National Implementation Plan, extensive national and community stakeholder consultations, which secured the participation and commitment of a wide range of stakeholders, were held throughout the Enabling Project Activity timeframe.

ENVIRONMENTAL OVERVIEW

A detailed environmental protection strategy was proposed in a National Structural Plan formulated for the 1976 - 1990 period. This included protection and conservation measures related to beach pollution, forest conservation and utilization, national parks, scenic and recreational facilities, critical environmental areas, historic structures, water catchments, fisheries and wildlife. Many of the recommendations contained in the National Structural Plan, such as the establishment of an Environmental Coordinating Unit and environmental impact assessment legislation, have, or are now being implemented.

The peculiarities of Dominica which are characteristic of Small Island Developing States predispose the island to several disadvantages derived from size. These include a narrow range of resources, a limited land resource base and relatively small watersheds and threatened supplies of freshwater. On the other hand, Small Island Developing States tend to

have high degrees of endemism and unique ecosystems, but the relatively small numbers of the various species impose high risks of extinction (e.g. *Amazona imperialis* – Sisserou Parrot*)* and create a need for protection. Given the small size of the country it is clear that issues of environment and development are closely interrelated and interdependent.

In Dominica, Environmental Management is a shared responsibility under several Ministries. However, the *Environmental Coordinating Unit of the Ministry of Agriculture, Fisheries and the Environment* serves as the technical focal point for all Multilateral Environmental Agreements, with direct responsibility for coordinating all activities related to these Conventions/Agreements, nationally. The Environmental Coordinating Unit's mandate is to function as the *"Coordinating, facilitating, administering and collaborating body for all environmental and sustainable development management programmes, projects, and activities in the Commonwealth of Dominica"*. The Environmental Coordinating Unit also work in collaboration with several Non-Governmental Organisations and Community Based Organisations, which play an active role in environmental management, including the National Association of Non-Governmental Organisations, which is the main Non-Governmental Organisation body in Dominica, the Global Environment Facility Small Grants Programme and the Youth Development Division.

LEGISLATIVE AND REGULATORY FRAMEWORK

Since the early 1970's, the Government of Dominica has recognized the need for specialized legislation and regulations to govern toxic and dangerous substances outside of those described and regulated under the *Medical Act of 1961*. This general legislative framework includes five Acts of direct relevance and several other Acts with peripheral reference:

1. *Pesticides Control Act of 1974* and associated regulations and amendments;
2. *Environmental Health Services Act of 1997*;
3. *Noxious and Dangerous Substances Act of 1982* and associated regulations;
4. *Solid Waste Management Act of 2002*;
5. *Marine Pollution Management Act of 2002* and associated regulations;
6. *(Proposed Bill) Pesticides and Toxic Substances Control*.

A key element of the proposed Action Plan of the National Implementation Plan for Persistent Organic Pollutants and other Hazardous Chemicals will be the revision of the proposed Bill for *Pesticides and Toxic Substances Control* to provide for a *Hazardous Materials and Hazardous Wastes Management Act* with associated regulations.

ASSESSMENT OF PERSISTENT ORGANIC POLLUTANTS AND OTHER HAZARDOUS MATERIALS

Of the nine Persistent Organic Pollutant pesticides assessed in the Farm-Seller-Hotel Survey of February 2006, one container of Mirex (0.5L) was identified at one farm and 0.25 L containers of Aldrin at two hotels/guest houses. Persistent Organic Pollutant pesticides have not been imported nor used in Dominica for over 20 years and the limited number of containers may have been brought into the island illegally. DDT has not been used in Dominica since the 1970's. The Farm, Stores and Hotels Inventory indicated Polychlorinated Biphenyls (PCB) occurred in the industrial sector as dielectric fluid of large transformers used by the electric utility, Dominica Electricity Company (DOMLEC). Of about 725 transformers in use, 14 (2%) contain PCB.

No pesticides or hazardous materials are produced locally. Some of the more commonly imported pesticides that are not Persistent Organic Pollutants include an extensive list of which

Vydate, Gramoxone, Primicid, Round-up, Touch-down, Baygon and Basta are the most commonly used. These are all used in the agriculture industry.

STOCKPILES AND CONTAMINATED SITES

No stockpiles of persistent organic pollutants exist on Dominica.

There is no "baseline" of concentrations or distributions of Persistent Organic Pollutants in the soils, sediments, fish, vegetation, river or marine waters of Dominica. To address the gap in knowledge regarding residual concentrations of Persistent Organic Pollutants in agricultural soils, soils from 17 farms, representing a range of farm types and with full distribution throughout Dominica were tested for a suite of organochlorine pesticides and Polychlorinated Biphenyls. Only three farms were found to contain detectable amounts of DDE/Dieldrin (a breakdown product of DDT); concentrations of all other pesticides and PCB were less than minimum detection limit. The second part of the baseline survey, entailed sampling fine-grained (i.e., materials most likely to accumulate pesticide residues) from 13 rivers. No detectable concentrations of any of the pesticides or PCB were found in any of the river sediments. The third part of the survey entailed sampling of soils near leachate areas of the former Portsmouth and Roseau landfills. Of these three samples, one sample from near the former Roseau Landfill at Stock Farm was found to contain DDE/Dieldrin, but no detectable amounts of other pesticides or PCB. The fourth part of the survey entailed taking soil samples from the Jimmit Solid Waste Facility of the Dominica Solid Waste Management Corporation. This facility receives a variety of materials ranging from tires to car lead batteries. There was evidence of past fires on the site and examples of plastics and other materials being burned. Of two samples taken, both showed evidence of several pesticides and PCB. The latter is of particular concern, as the samples were taken in areas of evident burning of wastes. The fifth part of the survey entailed collection of mullets, a lipid-rich small fish, collected in three rivers along the west coast of Dominica and representing drainage from three agricultural areas. All fish samples showed evidence of pesticide contamination, including residues of several Persistent Organic Pollutants. No data on release of [Scientific name] PCDF's (Furans) and PCDD's (Dioxins) into the atmosphere are available. However, some activities that are known to release these substances have occurred in the past and are likely to be occurring at this time, including open-barrel burning of used diothene fungicide bags (blue bags) in the banana industry, burning of wastes at dump sites such as Jimmit, burning of used tires (a current method of tire disposal), and the bush fires occurring in the dry season.

SOCIO-ECONOMIC, HEALTH AND THE ENVIRONMENT

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AWARENESS AND EDUCATION

There is limited information and knowledge regarding the 12 Persistent Organic Pollutants and limited knowledge regarding other hazardous chemicals by most "users", from importers to end users. As such, this poses a major national problem because of lack of knowledge of the risks associated with these pesticides and other hazardous materials. It is therefore important to develop and implement a public awareness and information programme to inform and sensitize the suppliers, users and general public on Persistent Organic Pollutants and other hazardous materials and hazards and risks associated with banned products, including stockpiles, and with the use of permitted Persistent Organic Pollutants and other hazardous chemicals.

There are number of departments with existing public awareness programmes that can be

utilized for this purpose, but all the public awareness programmes except that of the Dominica Banana Producers Limited are under-financed. Most of them are funded under administrative programmes and are not given priority in terms of allocation of resources. This has been manifested in the inability to buy airtime or space from print media and to purchase the equipment for implementation. This has hampered the sustainability of the programmes. Presently all the existing programmes have been scaled down due to reducing financial resources.

NATIONAL IMPLEMENTATION PLAN

To implement the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes, Dominica has developed an implementation strategy based on achieving an accepted set of goals, targets, timelines and environmental performance indicators.

The Implementation Strategy consists of seven steps as illustrated in *Table I: Key Action Steps of the National Implementation Plan*.

Table I: Key Action Steps of the National Implementation Plan

STEP 1	STEP 2	STEP 3
Basic Commitment	**Develop and Adopt Policy for the Environmentally-Sound Management of Hazardous Materials and Hazardous Wastes**	**Legislation and Regulations**
Party to: • ***Stockholm Convention*** • ***Rotterdam Convention*** • ***Basel Convention*** • ***Vienna Convention/ Montreal Protocol*** • ***Chemical Weapons Convention*** • ***MARPOL 73/78*** • ***Cartegena Convention***	Develop Policy Statement	Complete drafting of Hazardous Materials and Hazardous Wastes Act
	Conduct Stakeholder Consultations	Act approved by Cabinet and submitted to Parliament
	Modify Statement based on Stakeholder Consultations	Parliament passes Act and Act is formally Proclaimed
	Formally adopt modified Policy	Stakeholder consultation on Regulations
		New Regulations are published

Table I (Continued): Key Action Steps of the National Implementation Plan

STEP 4	STEP 5	STEP 6	STEP 7
Administration and Institutional Capacity Enhancement	**Management of Hazardous Materials and Hazardous Wastes**	**Training and Public Awareness**	**Monitoring**
Adopt administrative changes for Hazardous Materials and Hazardous Materials Management Board, including existing Pesticides Control Board	Administrative changes to provide for Regulation of all Hazardous Materials, including re-registration of existing Pesticide Registrations	Establish training programmes for government and private industry staff	Establish annual reviews of need to respond to changes in five Conventions
Administrative changes for Pesticides Control Officers	Establish Hazardous Materials Tracking System	Establish training programmes for Hazardous Material users	Use database and tracking system to prepare Annual State of Hazardous Materials Report to Parliament and to Conventions
Administrative changes for new Hazard Material Control Officers	Establish Hazardous Material receiving facility at Solid Waste Facility	Conduct Public Awareness Campaigns	Conduct campaigns to reduce and remove any stockpiles of POPs and other hazardous materials
Administrative changes for staff at Dominica Solid Waste Management Corporation	Extend and complete existing Pesticides Use and Activities Database	Identify alternative products to pesticides and promote such alternatives	Remove and properly dispose of known stockpiles of pesticides
Administrative changes for Labour Department and Environmental Health Department Officers	Enhance capacity for Pesticide Residues analysis at Crop Laboratory	Conduct training programmes on use of pesticides and safe application of pesticides	Complete removal of all PCB containing equipment from service
Professional Staffing changes for Environmental Coordinating Unit Hazardous Material activity	Establish Toxic Substances Referral Centre		Complete removal of all PCB containing fluorescent light ballasts from service
	Establish WHMIS and implement full MSDS and Workplace Occupational Health & Safety Programme		

ACTIVITIES, STRATEGIES AND ACTION PLANS

On the recommendation of the National Coordinating Committee, a Goal of implementing environmentally-sound management of Persistent Organic Pollutants and other hazardous materials and wastes was adopted by the Government of Dominica. From that Goal, the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes was developed and adopted. Adoption of this Policy and implementation of the elements of the Action Plan will enable the Government of Dominica to provide a net improvement to the health of its citizens and the general environment of Dominica.

The purpose of the Action Plan is to provide the Government of Dominica and the relevant private sector with a framework and set of Objectives, Targets, Performance Indicators and Milestones, all to assist in the implementation through a staged approach over a three-year horizon. After this time, the management of hazardous materials and hazardous wastes will be fully integrated into government and private business activities and the "incremental" costs will not be continued.

The Action Plan was set up in the format of an Environmental Management System, with identification of a primary concern/issue, an overall Goal and a series of Objectives, Targets, Performance Indicators and Milestones developed and agreed. The process of review and updating will continue in the Environmental Management System format, through the "Continuous Improvement Process" of (1) Policy development, (2) Planning, (3) Implementation.

The Strategy Framework has been divided into two parts to address (1) Persistent Organic Pollutants and (2) Other pesticides, hazardous materials and hazardous wastes. The Framework was developed during two major Stakeholder Consultations in March 2006 at which information being collected and reviewed to develop the National Profile was presented and discussed and Actions to address several identified issues were reviewed and discussed. At the Stakeholder Consultation in April 2006, the issues were reviewed from a view of risk reduction and risk management to develop priority activities for the Action Plan.

The following tables provide the key details on the Action Plan elements:

- Table II provides the Objectives, Targets, Performance Indicators and Milestones for the Persistent Organic Pollutants Management Activity.
- Table III provides the Objectives, Targets, Performance Indicators and Milestones for Other Pesticides and Related Chemical Substances Management Activity.
- Table IV provides the Objectives, Targets, Performance Indicators and Milestones for the Hazardous Materials and Hazardous Wastes Management Activity.
- Table V provides the Costs for Implementation for the Persistent Organic Pollutants Management Activity.
- Table VI provides the Costs for Implementation for the Other Pesticides and Hazardous Materials and Wastes Management Activity.
- Table VII provides the Costs for Implementation for the Overall Programme.

Table II: Timetable for Plan Implementation for Persistent Organic Pollutants and Measures of Success
(All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
9 POP Compounds	Phase out and ban NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Remaining stocks gathered and stockpiled	+ 0.75 year	Volumes of materials gathered	
		Stockpiles disposed	+ 1 year	Volumes of materials disposed	
		Full ban in place	+ 1 year		Cessation of use and stockpiles of 9 POP's
PCB in Equipment	Phase out and ban NIP start + 2 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Remaining stocks gathered and stockpiled	+ 1 year	Volumes of equipment gathered	
		Stockpiles disposed	+ 2 years	Volumes of equipment disposed	
		Full ban in place	+ 2 years		
PCB in fluorescent light ballasts	Phase out and ban NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Ballasts gathered and stockpiled	+ 2 years	Volumes of equipment gathered	
		Stockpiles disposed	+ 3 years	Volumes of equipment disposed	
		Full ban in place	+ 3 years		Cessation of use and equipment containing PCB
PCDD's and PCDF's	Ban substances and processes by NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Full ban in place	+ 1 year		Virtual cessation of generation of PCDD's and PCDF's
DDT pesticide	Restrictive use only by Permit	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Permit system established	+ 1 year	System proclaimed	Highly restricted use of DDT

Table III: Timetable for Plan Implementation for Other Pesticides and Related Chemical Substances and Measures of Success (All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
31 Rotterdam Convention Compounds	Phase out and ban NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Product alternatives identified and promoted	+ 1 year	Scope of substitution	
		Stockpiles disposed	+ 2 years	Volumes of materials disposed	
		Full ban in place	+ 2 years		Cessation of 31 Rotterdam Substances
Other Pesticides	Restrictions and Regulated Use NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Product alternatives identified and promoted	+ 2 years	Scope of substitution	
		Stocks disposed	+ 2 years	Volumes of equipment disposed	
		Permitted use only	+ 2 years		Pesticides under Management Process
Related Chemical Substances	Restrictions and Regulated Use NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Stocks gathered and stockpiled	+ 2 years	Volumes of equipment gathered	
		Stockpiles disposed	+ 2.5 years	Volumes of equipment disposed	
		Permitted use only	+ 2 years		Related chemicals under Management Process
Public Awareness Campaign and Training of Users	Major campaign completed NIP start + 2 years	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Campaigns completed	+ 2 years		Results of awareness survey
Ethylene oxide	Restrictive use with only use by Permit	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Permit system established	+ 1 year	Permit system proclaimed	Highly restricted use of Ethylene oxide (EtO)

Table IV: Timetable for Plan Implementation for Hazardous Materials and Hazardous Wastes and Measures of Success (All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
Identification system for Hazardous Materials and Wastes	UNGHS system fully adopted NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Haz Mat Officers appointed and trained	+ 0.75 year	Appointed staff complete training	
		Training completed for placarding, labelling and documentation	+ 1.5 years		
		Materials tracking system implemented	+ 2 years	Data based in place and in use	
		Full placard/label system in place	+ 2 years	Survey of transport and storage companies and locations	Materials identification system in place
System for occupational health and safety	WHMIS and related documentation in full use NIP start + 2 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Labour & Environmental Health Officers designated and trained	+ 0.75 year	Appointed staff complete training	
		Full WHMIS system in place in all locations	+ 1.5 years	Survey of places of employment using Haz Mat	
		Workers and employers fully trained in use of WHMIS and worker protection	+ 2 years	Tabulation of workers having taken appropriate training and/or awareness courses	Worker protection system in place

Table IV (Continued): Timetable for Plan Implementation for Hazardous Materials and Hazardous Wastes and Measures of Success (All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
Asbestos–containing materials	Ban imports and regulate existing installations NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Existing installations surveyed	+ 2 years	Data base of completed survey	
		Removal of material from high-risk cases	+ 3 years	Permits issued match survey data base	
		Permit system in place	+ 3 years		Highly restrictive use of asbestos products
Government institutional capacity enhancement	Complete institutional arrangements NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Haz Mat Control Board and Technical Advisory Board appointed	+ 0.75 year	Appointments formally announced	
		Other staffing completed	+ 0.9 year	Appointments formally announced	
		Government staff complete training	+ 1 year	Database of staff with appropriate training	Government component of Haz Mat Management System implemented
Private industry/business institutional capacity enhancement	Complete institutional arrangements NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Training and awareness courses completed	+ 1 year	Database of staff with appropriate training	
		Other staffing completed	+ 1 year		Private business implement Haz Mat Management System

Table IV (Continued): Timetable for Plan Implementation for Hazardous Materials and Hazardous Wastes and Measures of Success (All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
Hazardous wastes	System for receiving and disposing of Haz Waste in place NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Staffing at DSWMC completed	+ 0.75 year	Appointments formally announced	
		Training and awareness courses completed	+ 0.9 year	Database of staff with appropriate training	
		Facility at Fond Cole	+ 1 year	Facility opening formally announced	
		Pesticide Awareness and Household Hazardous Waste Days	+ 1.25 year	Volumes of wastes collected	
		Collect stockpiles of other hazardous wastes	+ 1.5 years	Volumes of wastes collected	
		Dispose of hazardous waste stockpiles	+ 2 years	Volumes of wastes disposed	Virtual elimination of old stocks of pesticides and haz mat and system in place to collect haz waste.
Contaminated sites/properties	Remediation of major sites NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Sites identified and assessed	+ 1 years		
		Sites remediated	+ 2 years		
		Clearance certificates issued	+ 3 years		Major sources of old contamination addressed

Table V: Persistent Organic Pollutants Component Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Contribution				Local Contribution			Totals	Activity
		Person	Cost	Expenses	Activity	Government Staff	Cost	Expenses		Cost
		(person-weeks)			Cost	(person-weeks)				
Legislation and Regulatory	Prepare legislation	2 Consultants	$11	$6	$17	6	$2	$0	$19	
	Prepare regulations	4 Consultants	$22	$12	$34	9	$4	$0	$38	
	Legal drafting tasks					7	$3	$0	$3	$60
Administration	MoAFE through relevant department POP person	52x3x1	$67	$10	$77				$77	
	Min Agric. Pest. Officer					52x3x1	$67	$15	$82	
	DSWMC Haz Waste					52x3x1	$67	$20	$87	
	Staff training	3 trainers	$17	$8	$25	3x30	$36	$5	$66	$312
Infrastructure	Pesticide Week							$5x3	$15	
	Disposal of old pesticide stocks							$45	$45	
	Disposal of old PCB stocks							$50	$50	$110
TOTAL					**$153**					**$482**

Table VI: Other Pesticides & Related Chemical Substances and Hazardous Materials & Hazardous Wastes Component Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Component				Local Contribution			Totals	Activity
		Person (person-weeks)	Cost	Expenses	Activity Cost	Government Staff (person-weeks)	Cost	Expenses		Cost
Legislation and Regulatory	Prepare legislation	2 Consultants	$11	$6	$17	2	$1	$0	$18	
	Prepare regulations	2 Consultants	$11	$6	$17	3	$1	$0	$18	
	Legal drafting tasks					3	$1	$0	$1	$37
Administration	Min. Trade Haz Mat Officer (2)					52x3x2	$134	$50	$184	
	MoAFE Pest. Officer (2)					52x3x2	$134	$50	$184	
	Haz Mat Control Board Exec. Sect.					52x3x1	$84	$30	$114	
	Staff training	3 Trainers	$17	$8	$25	3x30	$36	$5	$66	$548

Table VI (Continued): Other Pesticides & Related Chemical Substances and Hazardous Materials & Hazardous Wastes Component Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Component				Local Contribution			Totals	Activity
		Person (person-weeks)	Cost	Expenses	Activity Cost	Government Staff (person-weeks)	Cost	Expenses		Cost
Infrastructure	Solid Waste Storage Facility	3 design consultants	$17	$8				$50	$75	
	Haz Mat tracking system	3 Consultants	$17	$158		52x3x1	$49		$224	
	Haz Mat Placards and Labels			$30					$30	
	WHMIS components			$30					$30	
	Household Haz Waste Day							$30	$30	
	Two contaminated site remediations			$140				$40	$180	
	Disposal of old pesticide stocks							$75	$75	
	Pesticide Lab upgrade			$100					$100	
	Toxic Substances Referral Centre			$50		52x3x1	$49		$99	$843
TOTAL					**$609**					**$1,428**

Table VII: Total Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Component				Local Contribution			Totals	Activity
		Person	Cost	Expenses	Activity	Government Staff	Cost	Expenses		Cost
		(person-weeks)			Cost	(person-weeks)				
Legislation and Regulatory	Prepare legislation	1 Consultant	$22	$11	$34	8	$3	$0	$37	
	Prepare regulations	3 Consultants	$34	$17	$50	12	$5	$0	$55	
	Legal drafting tasks					10	$4	$0	$4	$96
Administration	MoAFE through relevant department POP person	52x3x1	$67	$10	$77				$77	
	Min. Trade Haz Mat Officer					52x3x2	$134	$50	$184	
	MoAFE Pesticide Officer					52x3x3	$202	$50	$252	
	DSWMC Hazardous Waste					52x3x1	$67	$20	$87	
	Haz Mat Control Board Exec. Sect.					52x3x1	$84	$30	$114	
	Staff training	3 Consultants	$34	$17	$50	6x30	$72	$10	$132	$846

Table VII (Continued): Total Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Component				Local Contribution			Totals	Activity
		Person	Cost	Expenses	Activity	Government Staff	Cost	Expenses		Cost
		(person-weeks)			Cost	(person-weeks)				
Infrastructure	Solid Waste Storage Facility	3 Consultants	$17	$8				$50	$75	
	Haz Mat tracking system	3 Consultants	$17	$158		52x3x1	$49		$224	
	Haz Mat Placards and Labels			$30					$30	
	WHMIS components			$30					$30	
	Pesticide Week							$15	$15	
	Household Haz Waste Day							$30	$30	
	Two contaminated site remediations			$140				$40	$180	
	Disposal of old pesticide stocks							$120	$120	
	Disposal of old PCB stocks							$50	$50	
	Pesticide Lab upgrade			$100					$100	
	Toxic Substances Call Centre			$50		52x3x1	$49		$99	$953
TOTAL					**$762**					**$1,906**

1. INTRODUCTION

In 2003 the Government of the Commonwealth of Dominica approved the ratification of the Stockholm Convention on Persistent Organic Pollutants. Subsequently, the instrument of ratification was submitted by the Government to the United Nations Headquarters and accordingly, Dominica acceded to the Convention on 8 August 2003. As Party to the Convention, Dominica is in a better position to prevent entry through trade of these products and to monitor their movement in trade worldwide. As a first step towards implementation of the Convention, Dominica has prepared a National Implementation Plan (NIP) for submission to the Conference of Parties (COP) by 17 May 2006.

In keeping with Dominica's commitment to the Stockholm Convention on Persistent Organic Pollutants, the Government of the Commonwealth of Dominica secured assistance from the Global Environment Facility, through the United Nations Environment Programme (UNEP) to develop the National Implementation Plan for Persistent Organic Pollutants in Dominica. The NIP development process provided an opportunity for Dominica to undertake a preliminary assessment of the existing use of Persistent Organic Pollutants, to determine the capacity to manage these chemicals, and to fulfill its obligations under the Stockholm Convention.

The Persistent Organic Pollutants Enabling Activity Project provided basic, but critical information that was used to inform policy and strategic decision-making, and assist in identifying priority activities within Dominica and within the context of national sustainable development efforts. The specific objectives of the Persistent Organic Pollutants Enabling Activity Project were to undertake an:

- Assessment of the existing legal and institutional framework;
- Assessment of existing capacity to implement the Convention and level of awareness on Persistent Organic Pollutant issues;
- Inventory of existing or obsolete Persistent Organic Pollutants and related chemicals;
- Assessment of the socioeconomic, health and environmental implications of Persistent Organic Pollutants and related chemicals;
- Development of an information system (database) and website;
- Development of a national chemicals profile and determination of objectives and priorities for sustainable chemicals management in Dominica.

In pursuing these objectives, the development process for Persistent Organic Pollutants management in Dominica was linked to and coordinated with related Conventions and existing national programmes on sustainable development, in particular programmes on chemicals management, integrated pest and disease management, environmentally sound waste management and overall sustainable management initiatives.

In order to ensure an effective and successful NIP, there were extensive national and community stakeholder consultations, which secured the participation and commitment of a wide range of stakeholders who were actively engaged in the process. Hence, the development of the NIP involved a widely consultative process.

The NIP development process was marred by one critical issue, that of limited time. The Project faced many delaying constraints, both before and during implementation, and as such a fourteen (14) month project had to be condensed into eleven (11) months and then subsequently into four (4) months of actual project assessments and NIP development.

Despite this major constraint, the Project was still able to produce the following outputs:

1. Preliminary National Profile on Chemicals Management with emphasis on Persistent Organic Pollutants;
2. Preliminary inventories of Persistent Organic Pollutant substances and other hazardous chemicals;
3. Assessment of national capacity to implement the Stockholm Convention;
4. Computerised database;
5. Identification of options to strengthen the management infrastructure of Persistent Organic Pollutants and other hazardous chemicals;
6. Increased awareness of the effects of Persistent Organic Pollutants and other toxic chemicals on human health and the environment;
7. Increased capacity to meet reporting obligations under the Stockholm Convention;
8. National Implementation Plan required under Article 7 of the Convention, and specific Action Plans and strategies required under the Convention.

As part of the NIP development process, several assessments were undertaken to determine existing legal and institutional capacity to manage Persistent Organic Pollutants; environmental, health and socioeconomic implications; and level of awareness of Persistent Organic Pollutants issues. Additionally, a preliminary national survey was conducted to determine the existing use of Persistent Organic Pollutants. The results of these assessments were presented at National and Community Consultations having participation by a wide cross section of stakeholders, who:

- Were informed about the Stockholm Convention, Persistent Organic Pollutants and the Enabling Activity Project;
- Were provided with a forum for establishing partnerships to allow for input into NIP;
- Reviewed the outcomes and recommendations of various assessments;
- Developed a list of priorities with respect to management of chemicals;
- Prioritised the management options; and
- Developed a draft NIP.

This document was developed on the basis of these assessments and consultations. A preliminary draft report was presented to a broad stakeholder group at a national consultation with policy makers and key stakeholders from relevant ministries, non-governmental organizations, private sector and youth. The results of this work, and its review at the consultation, formed the basis for the development of this ***National Implementation Plan and Action Plans for Persistent Organic Pollutants and other Hazardous Chemicals***, which has been submitted to the Government of the Commonwealth of Dominica for approval.

Background on Hazardous Materials and Related Chemical Substances Management in Dominica

Apart from a range of toxic chemicals employed in agricultural activities, there are several materials that could be considered to be hazardous to the environment in Dominica. Among these materials are PCB, old equipment containing PCB, waste oils from generators, machinery and vehicle, lead-acid batteries, old tyres, medical wastes, industrial effluents and packaging material for industrial materials.

The chemicals are considered necessary tools in the efforts of industrial producers, to obtain

optimal production both for their economic well-being and food safety. While the chemicals are useful for this purpose, their management and methods of deployment may cause concern both for the health of those immediately involved in their handling and persons living in an environment that may be contaminated by such toxic materials. These materials then become hazards and their proper management is of immediate concern to all.

The other groups of hazardous materials have very little to do with food safety but are definite threats to environmental health. PCB's are of greatest concern among these hazardous materials, being among the primary group of substances targeted by the Stockholm Convention. These PCB's are components of the insulating oils used in many large transformers employed by the local electricity generating company, DOMLEC. While efforts are being made to phase out these types of hazardous equipment, the storage and disposal of the old PCB-laden oils remains a problem. These oils are drained from de-commissioned transformers, which remain on location, awaiting proper disposal.

Waste oils from generators, machinery and motor vehicle continue to accumulate annually. The bulk of this material is kept in storage while a disposal mechanism for its export and recycling remains to be formulated. Meantime, the stored volumes remain an environmental hazard, as does the smaller volume emptied into drains by small garages and individual operators.

Several dealers in vehicle spares and by specialized battery agents, as well as garages sell lead-acid batteries. However, there is no formal method of disposal of the large number of batteries discarded each year, together with their lead and acid content. This remains an environmental hazard to be adequately managed , as does the hundreds of associated pollutant of old tyres generated by garages and individuals.

Disposal of medical wastes have been posing a serious environmental problem, including the unmeasured amounts of dioxins and furans that were formed by inefficient incineration. The current disposal method at the local landfill is soon to be superseded by the commissioning of a modern gasification unit. A remaining hazard to be given attention is that of monitoring and control of the hazardous substances imported by manufacturers, and the proper disposal of the wastes generated, including the contaminated containers of such materials.

Persistent Organic Pollutants NIP Development Process in Dominica

The development process for the National Implementation Plan for Persistent Organic Pollutants and other Hazardous Chemicals in Dominica was guided by the GEF "Initial Guidelines for Enabling Activities for the Stockholm Convention on Persistent Organic Pollutants" and the World Bank and UNEP technical "Guidelines for the Development of a National Implementation Plan" (NIP) [DRAFT]. The Persistent Organic Pollutants Enabling Project was implemented through a 'Project Team' which consisted of the National Executing Agency (NEA), National Project Coordinator (NPC), Project Assistant (PA), National Consultants (NC) [6], the International Expert Team (IET) [3] and the National Coordinating Committee (NCC). The NIP Development Process was conducted over four (4) months, during which the activities outlined below were undertaken.

Activity I: Determination of Coordinating Mechanism and Process Organization

The Enabling Activity Project commenced with the appointment of the National Project Coordinator and the Project Assistant, in August 2005. However, actual project assessment activities did not begin until January 2006 when all constraints were addressed, and the

National Coordinating Committee (NCC) was formally established, as well as when the Terms of Reference (TOR) for all local and international consultants were approved by UNEP. While no assessments were carried out during the first few months of the Project, several project initiation and public awareness activities were conducted.

In January 2006, implementation of the assessment activities of the Enabling Activity Project began with a "Sensitisation and Awareness" Consultation. This was a critical step in engaging stakeholders and encouraging their participation throughout the development of the NIP. Government Agencies, Non-Governmental Organisations (NGOs), Community Based Organisations (CBOs), Youth Groups, academia, professional bodies and the private sector were invited to the Initial National Consultation at the inception of the Persistent Organic Pollutants NIP development process to present the work plan and to sensitise stakeholders and partners about the initiative.

Activity II: Establishing a Preliminary National POPs Inventory and Assessing National Infrastructure and Capacity

Under this Activity, there were five sub-activities:

- Developing a National Profile for Chemicals Management, with emphasis on Persistent Organic Pollutants, inclusive of an assessment of relevant existing legislation;
- Developing a Preliminary National Inventory of the Persistent Organic Pollutants (but suitable for subsequent additions of other chemical substances in line with the evolving inclusion of other Persistent Organic Pollutants under the Stockholm Convention);
- Developing a Persistent Organic Pollutants Information System;
- Conducting a capacity-needs and awareness survey;
- Developing a human health, socio-economic and environmental risk evaluation process in support of priority setting.

Six (6) National Consultants and an International Expert Team, consisting of three (3) consultants, were engaged to conduct various assessments as outlined in the sub-activities listed above, and to provide technical advice and support to the National Executing Agency in the development of the NIP.

Since the implementation time of the Enabling Activity Project was shortened, the NEA decided that it would be beneficial for all Consultants and Project staff to work closely as a team to ensure the success of the development of the NIP. As such, weekly meetings were held with the national Consultants and regular email contact was maintained with the IET and the NCC. The IET had monthly missions to Dominica in order to partake actively in the consultation process and provide technical assistance in the development of the NIP.

Each national Consultant conducted their assessment during the four month period. Preliminary results were presented at a National Stakeholder Consultation held on 7 March 2006.

A preliminary national survey, targeting about 25% of the 6100 farms on Dominica, was conducted in order to determine the presence and use of Persistent Organic Pollutants and other Hazardous Materials in Dominica. The survey also targeted hotels/guesthouses and suppliers of these chemical substances. This survey was conducted in January-February 2006 over a two week period. Preliminary results were presented to stakeholders at a national consultation held on 6 March 2006.

The objectives of the Preliminary Survey were to assess:

- The current level of knowledge regarding Persistent Organic Pollutants and other hazardous materials;
- The status of Persistent Organic Pollutants and other hazardous materials in Dominica, in terms of import, transport, use, storage, distribution and disposal;
- Opinions about what can be done to safely use, store, distribute and dispose hazardous materials.

The survey results were used to provide the basis for future public awareness programmes as identified in the Action Elements of the NIP (Chapter 3), for Persistent Organic Pollutants and other hazardous materials management activities, and policy development.

Activity III – Priority Assessment and Objective Setting

A National Stakeholder Consultation was held on 6 April 2006, where stakeholders identified priorities for the management of Persistent Organic Pollutants and other Hazardous Materials and Hazardous Wastes in Dominica. These priorities and the results of the different assessments were then used to inform the development of the NIP.

Activity IV – Development of the National Implementation Plan

The different assessments, preliminary national inventory and stakeholder input from the national consultations were used to inform the development of the NIP. The 'Action Elements' of the draft NIP was distributed among the stakeholders and the National Coordinating Committee for review and input. The document was also presented to stakeholders at a National Consultation and five (5) Community Consultations that were held in five of the seven Agriculture Districts in Dominica. Consultations were also held with Extension Officers of the Division of Agriculture, Forestry, Wildlife and National Parks Division and the Dominica Banana Producers Limited. Several meetings/interviews were held with private sector companies such as the major suppliers of chemicals, and DOMLEC (the local electricity utility), Statutory Bodies such as Dominica Solid Waste Management Corporation, departments in various Ministries such as Physical Planning Division, among others. This first draft ***National Implementation Plan and Action Plans for Persistent Organic Pollutants and other Hazardous Materials and Hazardous Wastes*** was developed out of the series of National and Community Consultative Consultations and presented to a Stakeholders group at a consultative meeting on May 8, 2006.

Activity V – NIP Endorsement and Submission

The draft NIP Action Elements were presented to the National Coordinating Committee for input and comments on May 11, 2006. After some discussions, the draft NIP was endorsed by the NCC. This document will then be forwarded to the Cabinet of the Commonwealth of Dominica for endorsement.

2. COUNTRY BASELINE

2.1 INTRODUCTION

Geography and Population

The Commonwealth of Dominica lies between Guadeloupe to the north and Martinique to the south, at 15° 30' North Latitude and 61° 25' West Longitude. Dominica is the most northerly and largest of the sub-regional Windward Islands grouping, with a total land area of 750.6 square kilometres (290 square miles). Dominica is very mountainous and of volcanic origin and measures 47 kilometers long and 22 kilometers wide, at its widest point.

The topography of the island (Figure 1) is dominated by a central line of volcanic peaks that rise to 1,220 metres and from which radiate numerous ridges that extend to the coastline where they sometimes end abruptly as steep sea cliffs. The central watershed is no more than 6.5 km from the sea in all directions and for conservation purposes has been demarcated as National Park Reserve in which no agricultural farming is permitted. A number of subsidiary peaks (about 610 metres) are found just outside this central line of ridges, dislocating to some extent the natural radial distribution of the main ridges.

About 64, 780 hectares (ha) is considered available for agriculture, although an indeterminate proportion of this is unsuitable on account of slopes, excessive rainfall and accessibility. The relief is extraordinarily abrupt with highly dissected terrain, numerous steep or precipitous slopes and with relatively little flat land. Estimates of land slope classes as a percentage of the total area indicated that 85% of the land is very steep or mountainous, 13% is steeply undulating and 2% is flat or gently undulating.

Dominica has 153 kilometers (95 miles) of coastline, which adjoins a 715 sq. km coastal shelf. Its narrow continental shelf, which is more extensive on the east coast along with its steep, undulating underwater contours present special challenges and features.

Flat land is restricted to the coastal areas and in certain areas in the centre of the island. Seismic activity in Dominica is significant. It is estimated that over 90% of the population live within 5 kilometers of seismic activity zones.

Results of the 2001 National Census released by the Central Statistics Office indicate that the population is 71,242 with an average density of 94.91 per square kilometers, making it the least populated of the Windward Islands. The population distribution by parish or population zones indicates that the largest communities are Roseau (the capital city) and its environs with 14, 847 persons which represents almost 21% of the total population. Most of the population centers are along the coast.

Figure 1: **Topographic Map of Dominica**

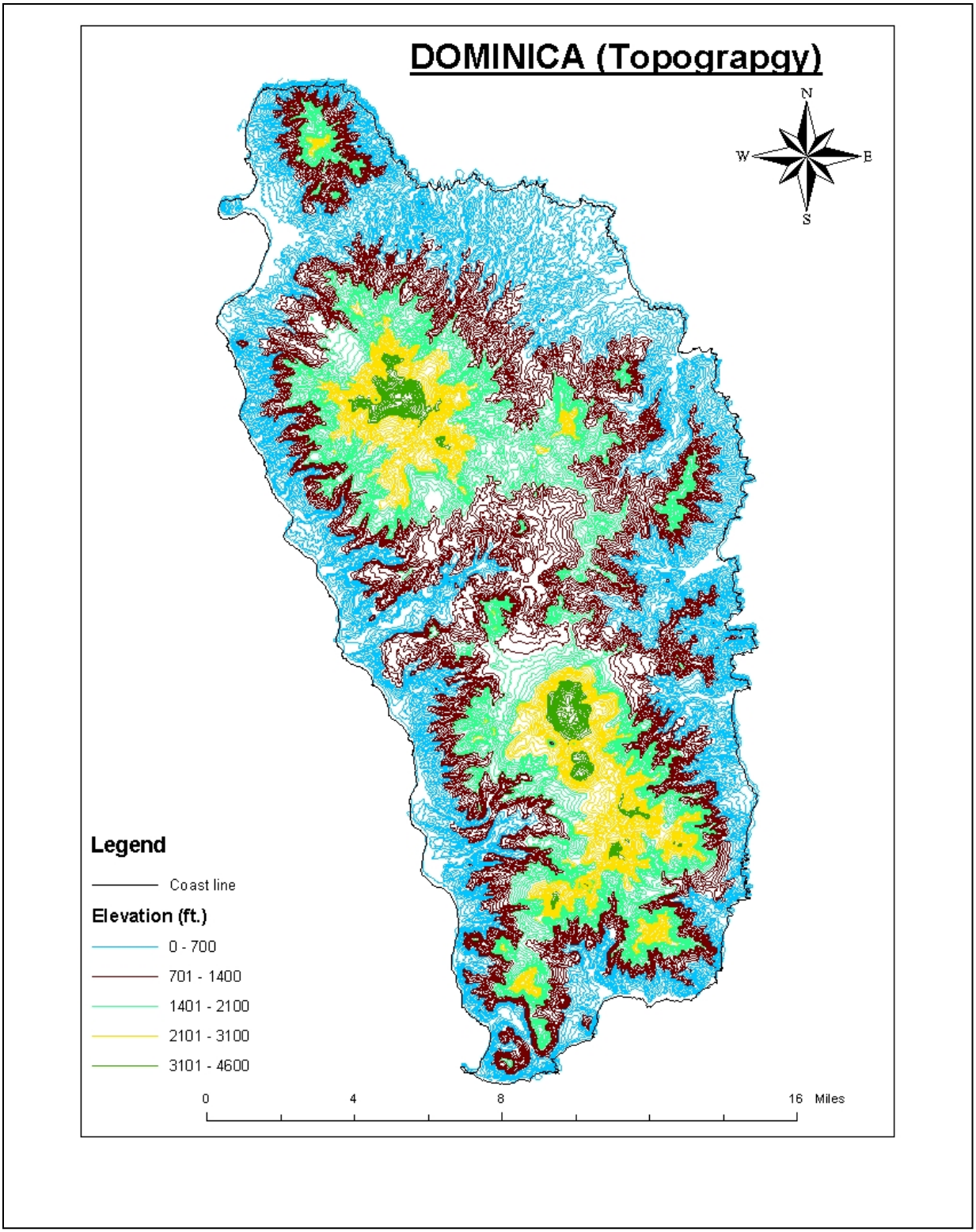
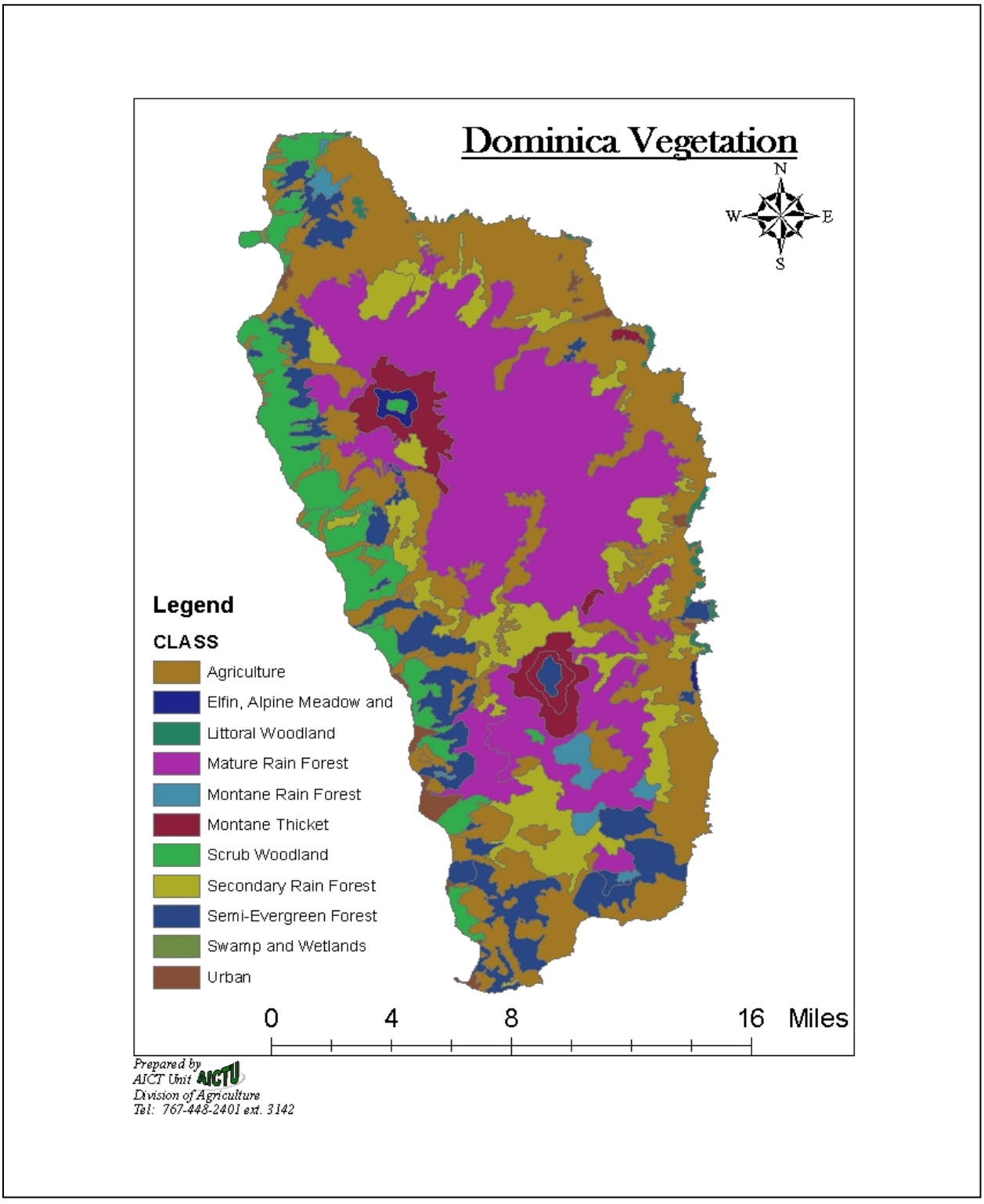


Figure 2: **Vegetation Map of Dominica**



Sixty-five percent (65%) of Dominica's land area is covered by vegetation ranging from dry scrub woodland on the coast to lush, tropical forest in the interior and a wide variety of fauna and flora (Figure 2). The interior is interspersed with rivers, waterfalls and lakes. This has earned Dominica the name "The Nature Island of the Caribbean".

The coastline of Dominica is richly endowed with an abundance and very diverse array of flora and fauna. The topography as well as the geological features, rainfall and climate of the two coastlines are different and hence provide differing habitats. The sub-marine topography is similar to that of the land, rugged and mountainous with very deep valleys. There is a very narrow continental shelf around the island and as a result the water plummets to depths in excess of 200ft very close to shore. There is also a wide range of estuarine habitat resulting from the many rivers found on the island.

The climate of Dominica is classified as "humid tropical marine", with average temperatures of 27^oC (80^oF). Because of the island's rugged topography, micro-climatic variability can exist within very short distances, influenced by the high moisture content of the air masses that enter the region from the Atlantic Ocean. This makes Dominica a very high rainfall country, with an average rainfall of 4500 mm (175 in) per year during the wet season. Rainfall increases from the leeward side eastward towards the central parts of the island where it reaches approximately 10, 200 mm (400 in) annually. The high rainfall makes the country susceptible to landslides, particularly in the more mountainous regions. Dominica is also vulnerable to hurricanes. Within the last decade the social and economic infrastructure of the country has been severely affected by a number of hurricanes.

A volcanic island with a series of complex mountain ranges, Dominica is characterised by very rugged and steep terrain. This topography has helped to protect the lush vegetation and has contributed greatly to the island's dramatic beauty and the conservation of its natural resources. Forests and arable land, estimated at 22.6% and 27.8% respectively of total land area, along with an extensive network of surface and underground water, make up the major natural resource base. Dominica possesses hydroelectric energy sources, and extensive marine resources including impressive coral reefs. Since the last decade increasing attention has being placed on the sustainable use of these natural resources. Dominica is ranked in the top ten of the best dive sites in the world.

Dominica is host to the most diverse assemblage of wildlife species remaining in the Eastern Caribbean. All the faunal groups are well represented. It is the great diversity of habitats encompassed within this island of less than 800 square kilometres that gives rise to a rich diversity of floral and faunal communities. The greatest diversity of animal life occurs in the rain forest with birds and bats particularly well represented[1]. Dominica has the most diverse avifauna of the Lesser Antilles despite its geographic location within the centre of the island chain.

Land Degradation includes all forms of long term loss in land resource potential, in all ecosystems. Unfortunately, scientific data on land degradation in Dominica has neither been quantified nor documented. The primary natural hazards affecting the island are intense tropical systems and their attendant impacts which include erosion, landslides and floods. The

[1] *Dominica Environmental Profile* 1991

Commonwealth Vulnerability Index rates Dominica as having the sixth most vulnerable economy (to external shocks and natural hazards) in the world, and the most vulnerable in the Caribbean. Over the period 1987 to 1997, Dominica was affected by nine tropical systems which ranged from localized wind blows to intense hurricanes. In addition, these storms result in severe depletion of the organic matter and soil nutrients in agricultural lands, thereby increasing the need for use of inorganic fertilizers, soil ameliorants and agricultural chemicals to realize production targets. Leaching of agrochemical residues and organic matter into rivers and streams, results in siltation and pollution of coastal habitats.

The Dominica Agricultural Census (DAC) of 1995 reported an increase in the number of farms (9101 – 10100), but a decrease in the acreage under farms (76,300 – 58,000) compared to 1961 data. It is also instructive to note the significant structural changes in the land tenure system as well as the actual land use in 1961 compared to 1995.

Of an estimated total landmass at 197,500 ha, 94,800 ha have been classified as unutilized, and 17,800 ha classified as suitable for agriculture. According to the 1995 Agriculture Census, 23,473 ha were under farms of which 61% or 13,031 ha were cultivated and 28.1 % or 5,980 ha in forest (see Table 2.1 - 1).

Table 2.1-1: Land Tenure and Changes in Tenure

Land Tenure				
Category	**1961**		**1995**	
	Acres (000's)	%	Acres (000's)	%
Owned	72.8	96.8	37.8	65.2
Family Land			6.3	10.9
Rented	2.2	2.9	3.2	5.5
Squatter			1	1.7
Communal			3.2	5.5
Other	0.2	0.3	0.8	1.4
Not Stated			5.7	9.8

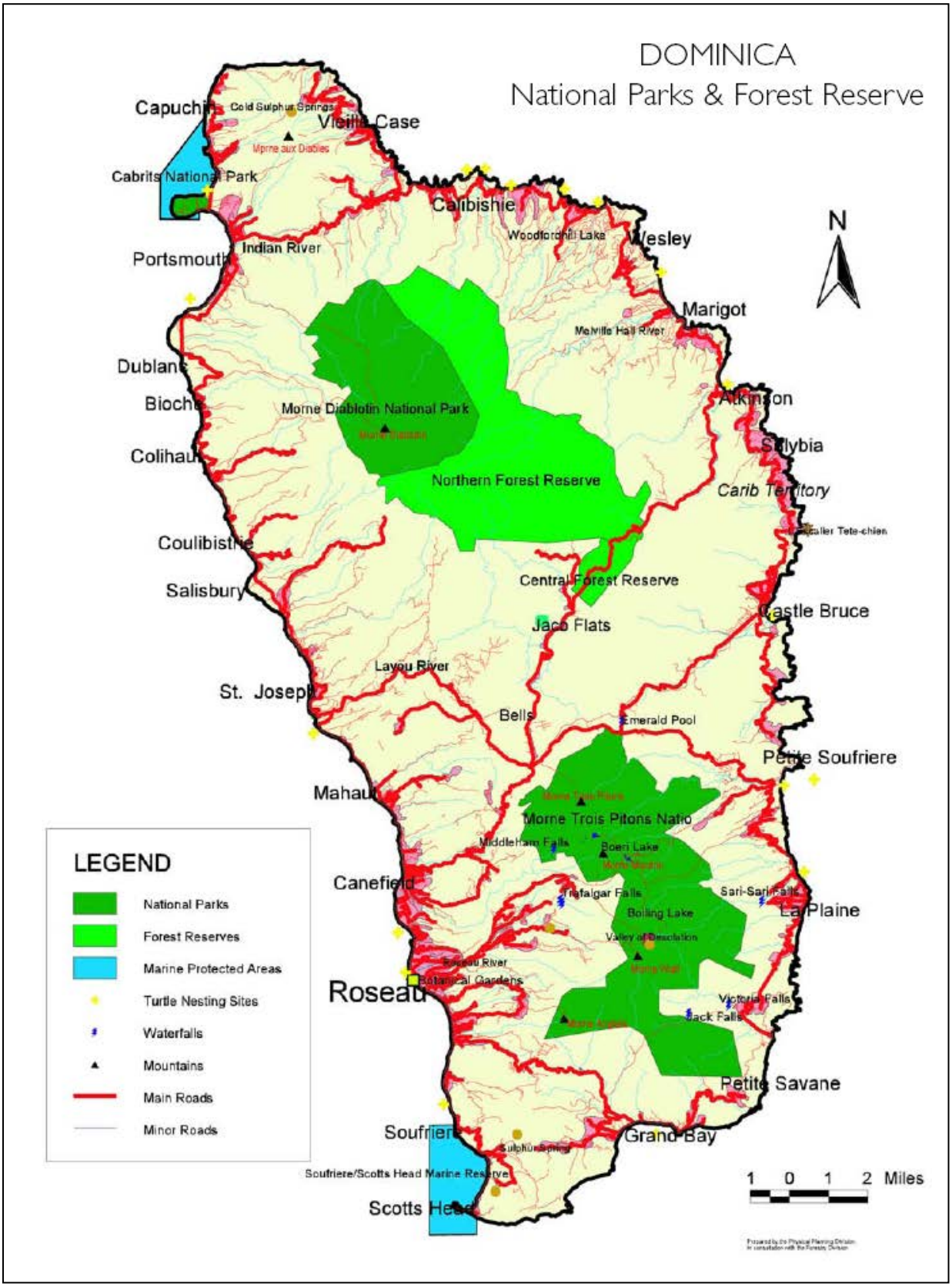
Source: Dominica Agricultural Census 1995.

The soils of Dominica form a very complex pattern due largely to the greater rainfall range and varied age and degree of dissection of the volcanic deposits of which the land is composed. The soils cover a fairly broad range of types, at one extreme, the protocols - very little weather and variably leached - and at the other end, the latosols with the readily weatherable minerals completely weathered and strongly depleted of nutrients.

25% of Dominica's forest lands are legally protected either as forest reserves or National Parks (Figure 3). Dominica has two (2) declared government Forest Reserves mainly the Central Forest Reserve(1013 acres) established in 1951 and the Northern Forest Reserve (13 528) established in 1977. These two Forest reserves in the north-central part of the island cover over 11% of Dominica's land area.

Three National Parks namely, Morne Trois Pitons National Park (16 980 acres) in 1975, Cabrits National Park (13 313 acres), which includes a marine component in 1986 and the Morne Diablotin National Park (8 242 acres were established. Management plans have been developed in the three National Parks.

Figure 3: **Map showing the National Parks and Forest Reserves in Dominica**



Political and Economic Profile

Agriculture is the mainstay of the economy. Throughout the last decade, the performance of Dominica's economy was led by the output from the Agricultural Sector with the sector contributing on average 18.48% of the Gross Domestic Product, (source: CSO 1999). It also accounts for 70% of total export earnings and 60% of foreign exchange. In addition, it supplies 60% of the food requirements and employs 30% of the labour force. Crop production generally accounts for over 80% of the agricultural output with smaller contributions from fisheries, livestock and forestry sub sectors.

Of the island states forming the Organization of Eastern Caribbean States (OECS) Dominica is the most dependent on Agriculture. Its rugged terrain, however, associated with its lack of expansive flat land has made the plantation system unattractive. The ancillary benefit of this history is that Dominica's ecosystem has remained by and large intact. Environmental and ecosystem integrity are again being recognized as critical to sustained agricultural production.

The economy of Dominica is described as being small, open and primarily agricultural-based. The island has always been in a vulnerable position economically, socially, culturally, and environmentally. Economic developments, in particular, are significantly affected by both natural and man-made external factors as is increasingly evidenced by the negative impact on the local economy of changes associated with such international phenomenon as globalization and trade liberalization. The dependence of the economy on the constricting banana industry exposes its high economic vulnerability. Attempts to diversify are slow, however recent trends indicate that the island is moving towards tourism, particularly nature-based tourism, as it markets its unique environment and culture. In doing so, Dominica becomes more acutely aware of the need to protect the environment.

The prevailing economic situation over the past five or more years has given rise to sluggish growth and little improvement in the levels of poverty. As such, the present government was compelled to establish a programme of Economic Stabilisation and Recovery in early 2001, which is aimed at, among other things maintaining fiscal stability and energizing economic growth. The stabilisation programme, which imposes stringent austerity measures, is intended to reduce public sector expenditure to sustainable levels in line with required standards set by international agencies such as the International Monetary Fund (IMF) and World Bank (WB). In 2006, while there are still social and economic challenges, there is indication that Dominica is making steady progress on the road to recovery.

It is recognized that poverty alleviation is an underlying issue to achieving sustainable development in any country, Dominica being no exception. The United Nations Millennium Declaration commitment to halve the number of people living in extreme poverty by 2015 is a concerted effort by governments to address the issue of poverty, hence promoting development through the achievement of specific goals, including that of environmental sustainability. The Millennium Development Goals (MDGs) already form part of Dominica's national development plans with poverty eradication being a priority.

Since, nine of the first 12 Persistent Organic Pollutant substances are pesticides and Dominica's economy is very much dependent on agriculture, it is indeed important for Dominica, as Party to the Stockholm Convention to be aware of any existence of Persistent Organic Pollutants within the island. Given the undesirable characteristics of Persistent Organic Pollutants, the preparation of the NIP as is obligated under the Convention, is extremely advantageous to Dominica. The NIP will provide a framework for Dominica to develop and

implement, in a systematic and participatory way, priority policy and regulatory reform, capacity building and, investment programmes, to protect human health and the environment from Persistent Organic Pollutants and by extension, other hazardous materials.

Environmental Overview

A detailed environmental protection strategy was proposed in a National Structural Plan formulated for the 1976 - 1990 period. This included protection and conservation measures related to beach pollution, forest conservation and utilization, national parks, scenic and recreational facilities, critical environmental areas, historic structures, water catchments, fisheries, and wildlife (GOCD, 1976). Over this period, local interest in environmental concerns increased, resulting in 1975 in the establishment of the Morne Trois Piton National Park. Two forest reserves were established in 1972 and 1977 respectively. The *National Parks and Protected Area Act* was passed in 1975, and during the same period the people of Dominica witnessed the establishment of two more national parks, the rejuvenation of the Dominica Conservation Association in 1990, and the designation of the years 1989 - 1990 as the "Years of the Environment and Shelter (YES)". Many of the recommendations contained in the National Structural Plan, such as the establishment of an Environmental Coordinating Unit and environmental impact assessment legislation, have, or are now being implemented.

The peculiarities of Dominica which are characteristic of Small Island Developing States (SIDS) predispose the island to several disadvantages derived from size. These include a narrow range of resources, a limited land resource base and relatively small watersheds and threatened supplies of freshwater. On the other hand, SIDS tends to have high degrees of endemism and unique ecosystems, but the relatively small numbers of the various species impose high risks of extinction (e.g. *Amazona imperialis)* and create a need for protection. Given the small size of the country it is clear that issues of environment and development are closely interrelated and interdependent.

In Dominica, Environmental Management is a shared responsibility under several Ministries. However, the *Environmental Coordinating Unit (ECU) of the Ministry of Agriculture, Fisheries and the Environment* serves as the technical focal point for all multilateral environmental agreements, with direct responsibility for coordinating all activities related to these Conventions/Agreements, nationally. The ECU's mandate is to function as the *"Coordinating, facilitating, administering and collaborating body for all environmental and sustainable development management programmes, projects, and activities in the Commonwealth of Dominica"*. The ECU also work in collaboration with several non-governmental Organisations (NGOs) and Community Based Organisations (CBOs), which play an active role in environmental management, including the National Association of NGOs (NANGO), which is the main NGO body in Dominica, the GEF Small Grants Programme (SGP), and the Youth Development Division.

2.2 Institutional, Policy, and Regulatory Framework

Environmental Policy, Sustainable Development Policy and General Legislative Framework

Currently, Dominica does not have an Environmental Policy in place. However, under the National Capacity Self Assessment (NCSA) Project, this issue has been identified and will be addressed under the Action Plan of the NCSA.

Additionally, while Dominica does subscribe to sustainable development methodologies, there is no Policy in place.

Since the early 1970's, the Government of Dominica has recognized the need for specialized legislation and regulations to govern toxic and dangerous substances outside of those described and regulated under the *Medical Act of 1961*. This general legislative framework includes five Acts of direct relevance and several other Acts with peripheral reference (see Table 2.2-1):

1. *Pesticides Control Act of 1974* and associated regulations and amendments. This Act provides for regulation of all pesticide substances, their Registration for import and use in Dominica and controls on their use, distribution, storage or sale on Dominica. The Act is administered by the Ministry of Agriculture, Fisheries and the Environment.

2. *Environmental Health Services Act of 1997.* This Act focuses on protecting the health of Dominicans through good practices and such activities as control of sanitary sewage and drinking water quality. With respect to Persistent Organic Pollutants and other hazardous materials, the Act provides for powers respecting occupational health and safety, food safety, potable water safety and vector control for public health.

3. *Noxious and Dangerous Substances Act of 1982* and associated regulations and amendments. This Act focuses on petroleum hydrocarbon fuels, fuel sales outlets and welding facilities/gases. However, the Act permits the Minister, from time to time, to specifically identify other materials or substances and set quantities of standard use. The Act is administered by the Ministry of Trade.

4. *Solid Waste Management Act of 2002* and associated regulations and amendments. This Act provides for the setting up of the Dominica Solid Waste Management Corporation within the Ministry of Health and the powers and responsibilities of the Corporation. This includes setting up and operating a waste collection system and the waste disposal facilities at Fond Cole and Jimmit, as well as closing out and de-commissioning of the former Portsmouth and Roseau landfills. There are no specific components dealing with hazardous wastes, nor are these addressed in the 2005-2010 Strategic Plan, currently under public consultation.

5. *Marine Pollution Management Act of 2002* and associated regulations. This Act provides the national implementation for Dominica being Party to the Basel Convention, the MARPOL 73/78 Convention and the Cartegena Convention of 1983. Of specific relevance to the management of Persistent Organic Pollutants and other hazardous materials are the adoption of provisions of Annex I (oil-contaminated wastewaters), Annex II (noxious and dangerous substances), Annex III (containers of noxious and

dangerous substances) and Annex V (garbage and solid waste). These wastes all originate from shipping (commercial and recreational), but the Port is required to have facilities and capacity available to receive and properly handle such materials. The Act also includes requirements for Dominica to properly manage land-based activities to minimize pollution to the marine environment.

Roles and Responsibilities of Government Ministries, Departments and Agencies Related to the Life Cycle of Hazardous Materials and Hazardous Wastes

Ministry of Agriculture, Fisheries and the Environment (MoAFE)

Policy Framework

Under the *Pesticides Control Act of 1974*, MoAFE is the primary institution with direct responsibility for pesticides control and management through a Pesticide Control Board (PCB). The mission of MoAFE is encapsulated in the following official statement;

- To enhance food security, growth and development of the agricultural sector through the sustainable utilization of human, natural and other resources.

Whilst the vision of MoAFE is;

- To contribute to the goal of national sustainable development through the delivery of high quality development and regulatory services, which add to the value to the agricultural sector, and enhance the natural resource base

The MoAFE comprises four Divisions/Units:

1) The Division of Agriculture, which is responsible for providing technical assistance, regulatory services and the policy framework to guide development of agriculture. To fulfill its mandate, the Division consists of a number of specialized Units, which work in collaboration with agricultural agencies and institutions to provide technical, regulatory and support services. This Division includes the Agriculture Extension Officers who deal directly with the farmers and who, therefore, strongly influence the implementation of any programme that manages pesticide use or pesticide alternatives.

2) The Forestry, Wildlife and Parks Division, established in 1949.

3) The Fisheries Division mandated under the *Fisheries Act of 1987* with the responsibility for managing the affairs of the marine environment

4) Environmental Coordinating Unit (ECU) was established by Cabinet in 1999, and has the overall function of bringing about more focused environmental management approaches to the solving of Dominica's environmental problems, advice government on the development of more coherent environmental polices and enhance Dominica's compliance with international treaties and conventions to which it is a signatory.

Table 2.2.-1: Legislative/Regulatory Framework

Legislation title & Date	Ministry or Entity Responsible	Comments
Pesticides Control Act (1974)	Ministry of Agriculture, Fisheries and the Environment and the Pesticides Control Board	Makes provision for regulating the manufacture, packaging, importation, sale and use of particular pesticides or classes of pesticides
Environmental Health Services Act (1997)	Ministry of Health & Social Security (Environmental Health Department)	The Act gives responsibility to the Minister of Health to regulate, monitor and control the actual and likely contamination or pollution of the environment from any source and to establish minimum standards
Marine Pollution Management Act (2002)	Marine Administration Unit	Prevents the dumping of wastes at se: the deliberate negligent or accidental release into the sea of oil and other harmful substances from ships
Physical Planning Act (2001)	Physical Planning and Development Authority	The Act seeks to achieve orderly and beneficial development and use of land and pattern of human settlement
Employment Safety Act (1983)	Ministry of Labour	Provides for the reorganization of health and safety systems for workers and the appointment of safety officers for purposes connected with occupational health and safety.
Water & Sewage Act (1989)	Dominica Water & Sewerage Company, DOWASCO	The Act establishes the company to provide water and sewage services under license
Water and sewerage regulation (1977)	DOWASCO	Provide a framework for DOWASCO to effectively operate the water supply and the sewage systems under the Act. It repealed the previous regulations
Standards Act (1999)	Ministry of Trade - Bureau of Standards	Provides for the promotion and preparation of national standards in relation to goods, services and processes
Litter Act (1990) Amendment (1991		Makes provisions for the abatement of nuisances caused by littering of premises and public places and prescribes penalties for offences
Solid Waste Management Corporation Act (2002)	Dominica Solid Waste Management Corporation	This act establishes the National solid Waste Management Corporation to control the collection and disposal of solid wastes

Legal and regulatory framework

The major legislation governing the management of pesticides is the *Pesticides Control Act of 1974.* This Act was reviewed in 2000 and a proposed Pesticides and Toxic Substances Control bill is still within the Ministry of Legal Affairs for finalization.

Two pieces of regulations relevant to management of pesticides are Registration and Licensing and Labelling of Pesticides which determine:

- importation requirements

- registration and licensing requirement
- banning or restriction of pesticides which may deem undesirable
- information exchange
- advisories on importation, disposal, and local manufacturing concerns, among others
- Setting standards for management, storage and sale of pesticides

The management of Persistent Organic Pollutants and other pesticides fall under the Ministry of Agriculture, Fisheries and the Environment through the Pesticides Control Board. Under the Act, the Board must comprise of the following persons: The Chief Medical Officer, the Chief Agricultural Officer, the Government Analyst and two other persons not employed within the government service.

Under the *Pesticides Control Act,* the Minister of Agriculture may employ inspectors to carry out investigations and exercise such powers as necessary for implementing the provisions of the Act and the regulations.

To assist with technical issues, the Pesticides Control Board has a Technical Advisory Committee, comprised of the following organizations as outlined below. The function of the committee is to advise on matters related to registration and licensing

- Plant Quarantine Officer
- Agronomist
- Pesticide Control Officer
- Farmer representative
- Director of Agriculture

The Technical Committee is responsible for evaluating the toxicity, health, impact of the pesticide or hazardous chemical on the environment and for making recommendations to the Board before registration. Once this is completed a license will be granted to the importer. Licenses are issued for every shipment of chemicals that is imported into Dominica.

Pesticide Control Officer - is responsible for the monitoring of, storage, handling and disposal of pesticides at the level of the importers, local suppliers and users, specifically the farmers. Also the Officer visits all storerooms and sales outlets of distributors of agriculture chemicals island wide. This entails the examination of the products on shelves and in storage so as to evaluate the packaging, labelling, handling and storage.

Any pesticide identified for manufacture, import, advertising, use and sale by the Importers/Agents, must be registered as an approved pesticide through the Pesticide Control Board and gazetted.

Persons desiring to have a pesticide registered must submit an application to the secretary of the Board requesting such registration using an approved form provided by the Board. The Applicant must include with the application form the name and address of the applicant and of the manufacturer or authority with whom the product is licensed or registered in the country of origin, the Material Safety Data Sheet (MSDS), outlining the trade name and name of the pesticide, all the chemical and physical properties of the pesticides as well as the pests they are purported to control, method and number of applications as well as application rates.

The scientific content of the pesticide and the degree and type of hazard are evaluated by the Technical Committee to determine its impact. If the Technical Committee is satisfied with the

chemical characteristics of the pesticide, it is recommended to the PCB for registration. The final step for registration of the chemical as an approved chemical is to have it gazetted. The pesticide shall be registered for a maximum period of three years after which it shall be reviewed by the Board.

Permits are issued to persons desiring of importing, distributing and handling of pesticides that are already registered. The function of the Pesticide Control Board is to advise the Minister and to carry out the provisions of the Act. The Board manages and controls the range, volume and level of pesticides that come into Dominica.

This entails the following:

- The determination of any application submitted for granting of licenses and permits
- Evaluation of the scientific content and degree of hazard of the pesticide
- Licensing of local manufacturers/ formulators of pesticides
- Registration of pesticide products to include the granting or cancellation of any registration, license or permit in accordance with the provisions of the act.
- Monitor the implementation of the regulation made under the act- the regulation entails the following:

Labelling of Pesticides

Every container in which a pesticide is imported, transported within, exposed or offered for sale or distributed in shall have a label, in the English language but not to the exclusion of other languages, with the following information:

- The trade or proprietary name of the pesticide
- The name and address of the distributor or manufacturer
- The common name of the active ingredients, its percentage contents and its net content by weight and volume, the precautions to be observed
- Precautions for handling and use of the contents and directions concerning the manner in which the pesticide is to be used.
- Specific information respecting the interval between the application of the pesticide and the sowing and harvesting of crops as well as the handling of treated crops by workers, grazing of animals on pastures that have been treated as well as slaughter of animals that have grazed on pastures which have been treated.
- The toxic nature of pesticides shall be indicated - the degree and type of hazard the warning and risk symbols and colours and words as set out in the schedule and the requisite medical treatment required in the event of poisoning

The regulations spell out the relevant colours, symbols and precautionary words for classification and labelling of pesticides according to the degree of toxicity as per the schedule contained in the regulations.

Registration and Licensing of Pesticides

The Board is advised by a Technical Committee to review scientific information on all pesticides as a prerequisite for registration and licensing.

Only those pesticides that have been registered as an approved pesticide by the Board and published in the Gazette can be manufactured, imported, advertised, sold, used, exposed or

offered for sale.

An application must be submitted to the Secretary to the Board, using an approved form provided by the Board, for registration of a pesticide. The application must be accompanied by all information contained in the label as detailed above and in the Material Safety Data Sheet specific to this pesticide and a certification of clearance from the competent authority with whom the product is licensed or registered, in the country of origin of the pesticide. In addition, the country of origin must indicate whether the product is approved for use in that country and if not, provide reasons. The Board may provide concessions to research institutions, notwithstanding the regulations, to import limited quantities of a pesticide for research only. The research institution is expected to keep a permanent record on the date of use of the pesticide the quantity used and the crop or animal to which the pesticide is applied. The Board also has the authority to provide a license to individuals, institutions or organizations not authorized under sub regulation (1) to import and use the pesticide.

The permit shall state the following:

- The period for which it is valid
- The quantity of pesticide which may be imported
- The conditions regarding the use of the pesticide

Registration period of a pesticide is three years, or shorter as determined by the Board at the end of which the Board reviews the pesticide in question for further approval.

The Board may refuse the registration of a pesticide on the following grounds:

- If the information required is insufficient
- If the pesticide is not safe or effective in pest control
- If it is a risk to public health

The Board may strike off the register of approved pesticides if it considers it expedient to do so in the interest of public health, safety of domestic animals or the preservation of wildlife and the environment. There is an approved registration form used by the PCB as per schedule contained in the regulations.

Only persons with an approved license obtained from the Board may manufacture, import, sell, expose or offer for sale an approved pesticide.

When issuing a license, the Board may:

- Specify restrictions on the persons, or class or classes of persons to whom such pesticides may be sold
- Stipulate that a sales register be kept in which the names and addresses of all persons purchasing such pesticides shall be entered together with the quantity purchased and the date of purchase. (Presently, this is not one of the stipulations)

An application for a license and provision of licenses are set out in an approved form as per forms 3 and 4 respectively as per schedule contained in the regulations. A license is valid for a period of six months or a lesser time set out by the Board. The validity of the license is not affected by a change in trade name of the pesticide or address of the person to whom the licensed is issued if the change is communicated to the Board before the expiration of one

month after it occurs.

By law, the Secretary to the Board is expected to within fourteen days of the decision of the Board to communicate to the applicant, the decision of the Board. The applicant can also, in case of an application being refused, re-apply to the Board for further consideration, after which the decision is considered final.

The regulation also sets standards for the following:

- The sale and distribution of pesticides: the consumer must be provided with information contained in the material safety data sheet (MSDS).
- Quality of products: The supplier shall not sell products that are decomposed or deteriorated to render it ineffective or dangerous. If packaging is deteriorated to make storage dangerous, it shall not be sold
- False advertising: the consumer is protected from false, misleading or deceptive advertising inconsistent with the scientific information supplied.
- Containers and transportation: pesticides shall be packed in suitable containers for transportation and ensure that during transportation there is no leakage to endanger the persons handling the pesticide, and that it is properly labelled and precautions taken to reduce the risk of contamination of any kind of food and water supply or destruction of plant and animal life.

Management Accountability and Financial Framework

The Pesticides Control Act indicates that “all expenses incurred in the administration of the Act shall be defrayed out of monies provided for the purpose by Parliament”. The Ministry of Agriculture provides an annual subvention for the payment of honorarium to members of the Board for quarterly meetings. The Pesticides Control Board generates limited revenues through the fees paid for licensing and registration.

The salary of the Pesticide Control Officer is paid by the Ministry of Agriculture. Currently, this Officer is also an Agriculture Extension Officer, also responsible for a geographical section of the farming community. The Pesticide Control Board utilizes the existing management accountability and financial framework of the Ministry of Agriculture, Fisheries and the Environment.

Human Resource Requirements

The Pesticides Control Act allows for the appointment of five persons to form the Pesticides Control Board and the appointment of Inspectors to assist the Board in the implementation of its functions.

Other functions related to Pesticide Management are within the purview of other Government Ministries as outlined above. The proposed new Act will require expanded human capacity because of expanded Divisions of licensing and permits, inspections, investigations, warrants, detentions and forfeiture

Interaction between Institutions and Processes to Achieve Outlined Objectives

The composition of the Pesticides Control Board is interdisciplinary and encourages some level of institutional interaction. There is some level of interaction between the Environmental Health

Department and the Pesticides Control Board, especially in areas of joint visits undertaken on a quarterly basis. However, there is need for more effective inter-sectoral mechanism among the various institutions and government ministries involved in the monitoring and management of pesticides and toxic chemical. This poses a huge gap in management because of the very important role each Department plays and the existing inadequate human and financial capacity.

MINISTRY OF HEALTH AND SOCIAL SECURITY/ ENVIRONMENTAL HEALTH DEPARTMENT

The Ministry has a legal mandate through the *Environmental Health Services Act No. 8 of 1997*. Section 11 addresses the interest of the environment-notification of health emission or discharge of contaminants of pollution

Under this Act the Environmental Health Department is responsible for monitoring of water, air quality and food safety. With respect to pesticide control, the Department carries out joint inspections with the Ministry of Agriculture of storage and disposal of pesticides and collaborates in dealing with related complaints.

In addition the department is responsible for Occupational Health and Safety of workers that would take into account the safe use, storage and handling of pesticides and hazardous material; however, the Ministry has neither the technical staff nor the laboratory equipment for analyzing chemical residues, concentration or contamination from pesticides or hazardous chemicals.

The Environmental Health Department utilizes two major chemicals to carry out its functions of control of insect pests and general sanitation as follows:

- Bait sand granules, 2% (phenthion) and Malathion 50- 55% and 95%- for mosquito control
- Malathion is used predominantly for pest control- ants cockroaches, wood ants and other public health pests
- Malathion, mixed with diesel fuel, is used for fogging

The Ministry of Health stores these pesticides in the storeroom, in the Botanical Gardens. This is routinely checked by the Pesticide Control Officer. Used chemical containers are disposed of through the Dominica Solid Waste Management Corporation.

Policy

There is no policy that governs the administrative and overall operations of the Environmental Health Department.

Legal Responsibility

The *Environmental Health Services Act No.8 of 1997* authorizes the Minister "to regulate, monitor and control the actual and likely contamination or pollution of the environment from any source, ensure compliance in all matters and activities relating thereto and establish minimum standards required for a clean, healthy and aesthetically pleasing environment".

It specifies the functions of the Environmental Health Department to include among others the

following:

- Investigate problems and institute preventive and remedial measures in respect of environmental pollution, the management and disposal of solid, liquid and gaseous wastes, food and drinks management, nuisances, rodents, insect pests and general sanitation;
- Conduct research, studies and monitoring programmes related to environmental and food pollution and undertake and carry out all related surveys, monitoring and investigations and prepare the necessary reports, plans and programmes;
- Promote the planning, approval, funding and implementation of measures designed to ensure the wise and safe use of the environment;
- Keep abreast of technological and other advances in the field of environmental health and initiate the updating of legislation, standards and procedures in this connection.

The Act also requires the Chief Medical Officer and the Chief Environmental Health Officer to maintain constant consultation with other Departments of Government, Ministries or Agencies that are responsible for matters related to environmental health. The Act provides for the establishment of a Board to advise the Minister. No such Board has ever been appointed. The appointment of the Board could serve as an inter-sectoral mechanism to support the activities of the Environmental Health department.

In terms of regulations governing the Act, these have been developed by the Environmental Health Department. However, the regulations are still being reviewed by the Ministry of Legal Affairs and thus have not been ratified and adopted by Government. Regulations provide for minimum standards with respect to pollution by hazardous and noxious chemicals. However the absence of regulations hampers the ability of the Department to enforce the laws.

Institutional Framework

The Environmental Health Department is currently staffed by 18 Environmental Health Officers including one Chief and 4 Senior Environmental Health Officers and 13 district Environmental Health Officers. Other staff includes 10 Vector Control Operators and 1 Lab Technician. Their priority programmes include the following:

- Vector control
- Sanitary waste disposal
- Food safety and communicable disease control
- Workers health and safety
- Water quality control

Except for sanitary waste disposal, all of the priority programmes can be directly affected by Persistent Organic Pollutants and other hazardous materials. The Department has a critical role to play in the monitoring of the management and use of Persistent Organic Pollutants and other hazardous materials.

Monitoring of water, soil, air and food, the media through which pesticides can be transported and concentrated are undertaken primarily by the Ministry of Health and Social Security through the implementing agencies of Environmental Health Department and the Dominica Solid Waste Management Corporation. Similar functions are also undertaken by several other Government Ministries and Statutory Bodies.

Table 2.2-2: Monitoring services carried out by the Environmental Health Department and Other Collaborating Agencies

Monitoring services undertaken by Environmental Health Department	Programme in Existence	Collaborating Agencies	Situational Analysis/ comments
Water Quality	Bacteriological analysis/coliform analysis Inspection and approval of water sources including rivers. Chlorine residual tests	DOWASCO Dept of Agriculture Bureau of Standards	**Only bacterial evaluation**
Industrial wastes	Solid waste is handled at the landfill- there is a facility for garbage separation. No facilities are available for handling chemical waste	Solid waste Management Corporation	
Hazardous Waste	Solid Waste Management Corporation		There is no management policy for the treatment of hazardous and toxic waste. Biomedical and toxic waste is discharged at the landfill and there is no special treatment in place to deal with this.
Food Safety Food Monitoring	Bureau of standard	Bureau of standards Food Importers Port Authority and Customs & Excise department	
Recreational Waters		Fisheries Division, Port Authority, Maritime Unit	No analysis is being undertaken on a regular basis
Port Health Handling of pesticides and hazardous waste	Environmental health does not have a Port Health Officer posted there.	Port Authority	Programme is limited to Woodbridge Bay. One Port Officer trained. Env. Health plans to post a port health Officer in the future
Air Pollution and Monitoring	No programme in place for monitoring air quality		No equipment or trained persons to undertake tasks
Workers health	There is no programme in place	Labour Department Unions	There are plans to develop a workers health and safety programme

Reproduced from Environmental Health Department

The Environmental Health Department monitors for residual chlorine in water. A report prepared by the Organization of Eastern Caribbean States (OECS) in 2000 indicated that "equipment for this is located in the field offices in seven districts throughout the island. The programme was evaluated as "ineffective", due to lack of human resources. Little collaboration exists between DOWASCO and the Environmental Health Department with regard to drinking water quality control.

With respect to Persistent Organic Pollutants and other hazardous materials, the Environmental Health Department does not monitor the following:

- Air Pollution due to pesticide applications; e.g., any form of spray application.
- Pesticides residues in foods sold in Dominica.

Mandates and Mission/Capacity Needs

An evaluation of the Environmental Health Department by the OECS in 2002 highlighted the following weaknesses:

- Ineffective legislative framework due to the general absence of regulations,
- The inability to enforce the legislation
- The lack of an officially established intersectoral mechanism to guide environmental policy and address environmental problems through a co-ordinated strategy.
- General shortage of qualified Environmental Health Officers
- Inadequate monitoring capability

The Study indicated that their monitoring programmes were ineffective due to lack of human resources as well as infrastructure requirements especially related to laboratory testing. The Water Quality laboratory at the Botanic Gardens is very small, it lacks equipment and human resources with only one lab technician. Capacity needs include environmental science and pesticide analysis. In addition, it was felt that the retraining and retooling of officers were necessary.

See Table 2.2-2 above for additional capacity needs

MINISTRY OF FOREIGN AFFAIRS, TRADE AND LABOUR – BUREAU OF STANDARDS

The Bureau of Standards was established by the *Standards Act No. 4 1999* with the responsibility for the promotion and encouragement of the maintenance of standards for the following:

- For the improvement of goods produced or used in Dominica;
- For services produced or used in Dominica and;
- In relation to processes and practices;
- For ensuring industrial efficiency and development and promoting public and industrial welfare and health and safety for safeguarding the environment.

The general administration of the affairs of the Bureau of Standards is carried out by the National Standards Council. The Council seeks to lay down the foundation for the process for the development, reviewing and adoption of standards. The council has four committees in the areas of fresh food products, processed foods, fresh produce, labelling and construction.

Discussions with the Director indicated that the Department is currently looking at development of standards with respect to Persistent Organic Pollutants and other hazardous materials. However this will fall under the *Prohibition of Chemical Weapons Act* that should be subsumed under the new Pesticides and Toxic Substances Control Act. It was noted that no initiatives have as yet been undertaken by the Bureau to develop any standards with respect to the management and impact of Persistent Organic Pollutants or other hazardous materials. The Bureau has developed standards for labelling of products, but not within the context of the *Pesticides Control Act of 1974*.

The development of standards for the management of Persistent Oganic Pollutants and other hazardous material is critical to effective management of these to reduce the impact on public health, and the environment. This will also reduce the need for excessive legislation to deal

with the various problems identified in management of pesticides.

In areas of capacity needs, areas of training identified are as follows:

- Analytical Chemistry
- Chemical Engineering
- Pesticide residue analysis in foods
- Monitoring Functions of Other Agencies

DOMINICA WATER AND SEWERAGE COMPANY (DOWASCO)

Under the Water *and Sewerage Act of 1989* DOWASCO assumed legal responsibility for water supply and sewerage. DOWASCO is responsible for 47 water systems. All systems utilize rivers and streams as water sources. Many watersheds are located on private land and are exposed to human activity especially farming with potential for contamination by pesticides.

DOWASCO is responsible for ensuring physical and bacteriological quality of drinking water to meet WHO guidelines and the removal of water turbidity by filtration and disinfection especially after high rainfall. Other responsibilities include the overall water conservation and protection of water catchment areas, a responsibility shared with the Forestry, Wildlife, and National Parks Division of the Ministry of Agriculture, Fisheries and the Environment.

DOMINICA SOLID WASTE MANAGEMENT CORPORATION (DSWMC)

The DSWMC has been established since 2002 through the *Solid Waste Management Corporation Act No. 2 of 2002* as a statutory organization to manage solid waste and to collect, haul and dispose of ship-generated waste, jointly with the Marine Administration Authority and the Ministry of Health.

The major function of the DSWMC with respect to Persistent Organic Pollutants and other hazardous materials is the effective disposal of chemicals and chemical containers.

The Corporation has no policy in place with respect to disposal of hazardous waste materials. As such, the DSWMC does not have specialized facilities for the handling, treatment or disposal of any Persistent Organic Pollutant or other hazardous wastes, including used containers. The chemicals are disposed of at the Fond Cole Landfill, with no special treatment.

The DSWMC lacks the physical infrastructure or equipment for effectively handling hazardous wastes. There is no separation of waste at the new landfill and this has serious implications for pollution control.

The DSWMC requires improved infrastructural resources for separation of hazardous waste and proper disposal. Additionally, the DSWMC requires additional financial resources for staff recruitment, effective collection and disposal of waste including medical and agricultural waste.

DOMINICA PORT AUTHORITY/ CUSTOMS AND EXCISE DEPARTMENT

The Dominica Port Authority is a statutory body responsible for landing of imported goods by sea that meet the requirements set out in the regulations for importers of Persistent Organic Pollutants and other hazardous materials. Importers must provide to port personnel their license to operate before clearing goods.

The legislative framework guiding the landing of pesticides and hazardous chemicals is the International Maritime Code on Dangerous Goods (IMDG) that provides a set a rules and symbols for identification, handling and storage of dangerous goods and substances. Additionally the Pesticide Act outlines requirements for the labelling of containers in which pesticides are imported and transported.

The Port Authority is responsible for the monitoring of the movement of toxic and dangerous chemical within the international and national legal frameworks and instruments and as far as possible to stop illegal traffic in toxic and dangerous products and waste and to ensure the safe transport of dangerous goods/chemicals.

As such, it is important that the Port has the capacity to read and determine the toxicity of chemicals and to assess exposure analysis both of which are important to risk assessment and analysis.

The Port has a special area for storage of pesticides and chemicals. However, the storage area has no special designation, no warning signs or placards and is only a special area due to a separate lock for the room, forming part of Warehouse #3. No staff have training in handling or storage of dangerous goods, other than to recognize the IMDG code placards and place such materials in the special room.

Discussions with the Port Manager indicated that there is a need to continue to upgrade the occupational health and safety of port staff and this is ongoing. In terms of capacity needs he identified the need to do across the board training for stevedores, longshore men, forklift operators and port officers so as to increase the number of officers responsible for the handling and storage of chemicals. Other training requirements identified were technical training with respect to interpretation of the various codes and symbols of the IMDG.

CUSTOMS AND EXCISE DEPARTMENT

The Ministry of Finance, through the Department of Customs and Excise Control under the Customs and Excise Act, is responsible for actual clearance of the products that meet the requirements as set out in the regulations.

Persons clearing goods must show a copy of their license

The Customs does not have specialized trained staff for inspection of imported goods. Any staff on duty undertakes this task. It was felt that the department should have specialized staff for so doing/

Capacity needs include the following:

- Training in handling and inspection of pesticides
- Occupational health and safety
- Insurance coverage for staff.

REGIONAL INSTITUTIONS

Caribbean Agro-chemical Management Project (CAMP) developed a strategy for improved management and use of agrochemicals-policy level support and public awareness. This was developed and endorsed by the Caribbean Group of Pesticide Control Boards, CGPC, in June 2003 based on a 3- year research project that analysed the extent of the problem and the impacts of agrochemical on public and environmental health.

The strategy promotes a holistic approach encompassing the various stakeholders and institutions involved in agro-chemicals use and management, from import or manufacture to monitoring the effects of application on the land interface. It aims to increase national and regional awareness of the need for improved agro-chemical management via communication and advocacy. (The development of media packs press releases and radio jingles, video and poster for best practice material focusing on one element of the strategy).

Projects identified are as follows:

- Database
- Public health monitoring
- Maximum residue limits
- Environmental monitoring
- Research strategy
- Cost recovery mechanism
- Legislation
- Institutional arrangement
- GAP certification

Coordinating Group of Pesticides Control Boards of the Caribbean, CGPCBC

Coordinating groups of pesticide control boards of the Caribbean, CGPCBC came together to form an organization –the Caribbean Pesticides and Toxic Chemical Control Board, CPTCCB. The mission statement of the group is “To promote sustainable agriculture and to protect human health and the environment through effective management of pesticides and toxic chemicals in the Caribbean”. Caribbean Pesticides and Toxic Chemicals Control Board (CPTCCB) - consist of the chairperson of individual islands pesticide Board. The Mission is

At the OECS level the following has been undertaken:

- Development of a Draft Model legislation “OECS Pesticides and Toxic Chemical Control ACT, 1994” by the OECS and passage into law by some of the islands
- Development of harmonized guidelines for pesticide registration and control in the OECS & Barbados
- Organization of Pesticide Awareness Day- September, 27
- Draft guidelines for certification of commercial pesticide control operators in the OECS
- Development of “Good Agricultural Practices” Project

Relevant International Commitments and Obligations

Environmental Conventions to which Dominica is a Party

International Agreements	Status
1. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	Acceded 5th May 1998. In effect 3rd August, 1998
2. UN Convention on Biological Diversity ▪ Cartegena Protocol on Biosafety	Ratified 5th July, 1994 Ratified 13th July 2004
3. Cartegena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean ▪ Oil Spill Protocols ▪ MARPOL Protocol Annexes 2 and 5	Ratified 7th September 1990 Ratified 7th September 1990 Acceded 2000
4. International Convention on Civil Liability for Oil Pollution Damage	Acceded August 2001
5. UN Framework Convention on Climate Change	Ratified 21st March, 1994
6. Cotonou Agreement (Replaced the Lome Convention)	Ratified. 26th July, 2002
7. UN Convention to Combat Desertification	Ratified 28th November, 1997
8. UN Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Ratified 30th June, 1995
9. Third UN Convention of Law of the Sea (UNCLOS)	Ratified 3rd September, 1991
10. Convention on the Limitation of Liability for Maritime Claims Relating to the Arrest of Sea Going Ships	Acceded August, 2001
11. Treaty for the Non-proliferation of Nuclear Weapon	Acceded 3rd August, 1983
12. International Convention on Oil Pollution Preparedness, Response and Cooperation	Acceded August 2001
13. International Plant Protection Convention	Ratified April 1979
14. UN Convention on the Prohibition and Use of, Stockpiling Production and Transfer of Antipersonnel Mines and their Destruction	Ratified 26th March, 1999
15. UN Convention on the Prohibition of the Development, Production and Stockpiling and Use of Chemical Weapons and (weapons of mass destruction) their Destruction (Chemical Weapons Convention)	Ratified 12th February, 2001
16. Geneva Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques	Ratified 9th November, 1992
17. UNESCO Convention on the Protection of the World Cultural and Natural Heritage	Ratified 4th July, 1994
18. International Convention for the Regulation of Whaling	Acceded 18th June 1992
19. Suppression of Unlawful Acts Against Safety of Maritime Navigation	Acceded August 2001
20. International Convention for the Safety of Life at Sea	Acceded 2000
21. Stockholm Convention on Persistent Organic Pollutants (POP's)	Acceded 3rd August 2003
22. Vienna Convention for the Protection of the Ozone Layer 23. Montreal Protocol on Substances that Deplete the Ozone Layer 24. London Amendment	Ratified 30th March, 1993 Ratified 20th June 1993 Ratified 30th March, 1993
25. Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	Acceded January 2006
Caribbean Agreements	**Status**
1. CARICOM Regional Fisheries Mechanism	Signed 2002
2. St George's Declaration on Principles of Environmental Sustainability in the OECS	Signed April 2001

Dominica acceded to the Stockholm Convention on 8 August 2003. Other English-speaking Caricom countries that also Party to the Stockholm Convention are:

- Antigua & Barbuda – 10 September 2003
- Barbados– 7 June 2004
- Jamaica -23 May 2001
- St. Kitts & Nevis – 21 May 2004
- St. Lucia – 4 October 2002
- St. Vincent & the Grenadines – 15 September 2005
- Trinidad & Tobago – 13 December 2002

While the Stockholm Convention was adopted on the 22 May 2001, it did not enter into force until 17 May 2004. As such, there is no Dominica legislation specifically dealing with Persistent Organic Pollutants.

Description of Existing Legislation and Regulations

There are three relevant pieces of legislation to deal with the management of hazardous and other noxious and dangerous chemicals in Dominica. Various other Acts also contain some relevant sections or references.

The primary piece of existing legislation is: *An Act To Provide For The Control Of The Importation, Sale, Storage And Use Of Pesticides*, commonly known as the *Pesticides Control Act of 1974*.

This legislation was enacted on the 4 June 1974, well before development of the Stockholm Convention.

1. Pesticides Control Act of 1974. This Act was reviewed in 2000 and a proposed Pesticides and Toxic Substances Control bill is still within the Ministry of Legal Affairs for finalization.

Under the *Act,* the Minister of Agriculture may employ inspectors to carry out investigations and exercise such powers as necessary for implementing the provisions of the Act and the regulations.

To assist with technical issues, the Pesticides Control Board has a Technical Advisory Committee, comprised of the following organizations. The function of the committee is to advise on matters related to registration and licensing

The Technical Advisory Committee is responsible for evaluating the toxicity, health, impact of the pesticide or hazardous chemical on the environment and for making recommendations to the Board before registration. Once this is completed a license will be granted to the importer. Licenses are issued for every shipment of chemicals that is imported into Dominica.

The Pesticides Control Office is responsible for the monitoring of storage, handling and disposal of pesticides at the level of the importers, local suppliers and users, specifically the farmers. Also the Officer visits all store rooms and sales outlets of distributors of chemicals, island wide. This entails the examination of the products on shelves and in storage so as to evaluate the packaging, labelling, handling and storage.

Any pesticide identified for manufacture, import, advertising, use and sale by the

Importers/Agents, must be registered as an approved pesticide through the Pesticide control Board and gazetted.

Persons desiring to have a pesticide registered must submit an application to the secretary of the Board requesting such registration using a Board form. The Applicant must include submit with the application form the name and address of the applicant and of the manufacturer or authority with whom the product is licensed or registered in the country of origin, the material safety data sheet (MSDS), outlining the trade name and name of the pesticide, all the chemical and physical properties of the pesticides as well as the pests they are purported to control, method and number of applications as well as application rates.

The scientific content of the pesticide and the degree and type of hazard are evaluated by the technical committee to determine its impact. If the technical committee is satisfied with the chemical characteristics of the pesticide, it is recommended to the PCB for registration. The final step for registration of the chemical as an approved chemical, is to have it gazetted. The pesticide shall be registered for a maximum period of three years after which it shall be reviewed by the Board.

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This entails the following:

- The determination of any application submitted for granting of licenses and permits
- Evaluation of the scientific content and degree of hazard of the pesticide
- Licensing of local manufacturers/ formulators of pesticides
- Registration of pesticide products to include the granting or cancellation of any registration, license or permit in accordance with the provisions of the act.
- Monitor the implementation of the regulation made under the act- the regulation entails the following:

<u>Labelling of Pesticides</u>

Every container in which a pesticide is imported, transported within, exposed or offered for sale or distributed in shall have a label, in the English language but not to the exclusion of other languages, with the following information:

- The trade or proprietary name of the pesticide
- The name and address of the distributor or manufacturer
- The common name of the active ingredients, its percentage contents and its net content by weight and volume, the precautions to be observed
- Precautions for handling and use of the contents and directions concerning the manner in which the pesticide is to be used.
- Specific information respecting the interval between the application of the pesticide and the sowing and harvesting of crops as well as the handling of treated crops by workers, grazing of animals on pastures that have been treated as well as slaughter of animals that have grazed on pastures which have been treated.
- The toxic nature of pesticides shall be indicated- the degree and type of hazard the warning and risk symbols and colours and words as set out in the schedule and the requisite medical treatment required in the event of poisoning

The regulations spell out the relevant colours, symbols and precautionary words for classification and labelling of pesticides according to the degree of toxicity as per the schedule contained in the regulations.

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- The period for which it is valid
- The quantity of pesticide which may be imported
- The conditions regarding the use of the pesticide

Registration period of a pesticide is three years, or shorter as determined by the Board at the end of which the Board reviews the pesticide in question for further approval.

The Board may refuse the registration of a pesticide on the following grounds

- If the information required is insufficient
- If the pesticide is not safe or effective in pest control
- If it is a risk to public health

The Board may strike off the register of approved pesticides if it considers it expedient to do so in the interest of public health, safety of domestic animals or the preservation of wildlife and the environment. There is an approved registration form used by the PCB as per schedule contained in the regulations

Only persons with an approved license obtained from the Board may manufacture, import, sell, expose or offer for sale an approved pesticide.
When issuing a license, the Board may

- specify restrictions on the persons, or class or classes of persons to whom such pesticides may be sold
- Stipulate that a sales register be kept in which the names and addresses of all persons purchasing such pesticides shall be entered together with the quantity purchased and

the date of purchase. (Presently, this is not one of the stipulations)

An application for a license and provision of licenses are set out in an approved form as per forms 3 and 4 respectively as per schedule contained in the regulations. A license is valid for a period of six months or a lesser time set out by the Board. The validity of the license is not affected by a change in trade name of the pesticide or address of the person to whom the licensed is issued if the change is communicated to the Board before the expiration of one month after it occurs.

By law, the Secretary to the Board is expected to within fourteen days of the decision of the Board to communicate to the applicant, the decision of the Board. The applicant can also, in case of an application being refused, re-apply to the Board for further consideration, after which the decision is considered final.

The regulation also sets standards for the following:

- The sale and distribution of pesticides: the consumer must be provided with information contained in the material safety data sheet (MSDS).
- Quality of products: The supplier shall not sell products that are decomposed or deteriorated to render it ineffective or dangerous. If packaging is deteriorated to make storage dangerous, it shall not be sold
- False advertising: the consumer is protected from false, misleading or deceptive advertising inconsistent with the scientific information supplied.
- Containers and transportation: pesticides shall be packed in suitable containers for transportation and ensure that during transportation there is no leakage to endanger the persons handling the pesticide, and that it is properly labelled and precautions taken to reduce the risk of contamination of any kind of food and water supply or destruction of plant and animal life.

2. *Noxious and Dangerous Substances Act of 1982* authorizes the Minister for Trade to make regulations to control the acquisition, purchase, sale, dealing in, use and storage of noxious or dangerous substances in accordance with this Act and Regulations made hereunder so as to minimize the danger of accidental damage or injury to the public or any persons handling, storing or using such substances.

Under the Act, the Minister shall appoint a Noxious and Dangerous Substances Inspector to conduct inspections. The Inspector is also responsible for issuing permits respecting the possession and storage of such goods,

The Act lists the currently regulated substances as:

- Liquid petroleum gas
- Petroleum spirits
- Diesel
- Kerosene
- Aviation fuel
- Acetylene gas
- Oxygen gas
- Other substances “declared to be a noxious or corrosive substance.

3. Environmental Health Services Act of 1997 authorizes the Minister for Health “to regulate, monitor and control the actual and likely contamination or pollution of the environment from any

source, ensure compliance in all matters and activities relating thereto and establish minimum standards required for a clean, healthy and aesthetically pleasing environment".

It specifies the functions of the Environmental Health Department to include among others the following:

- Investigate problems and institute preventive and remedial measures in respect of environmental pollution, the management and disposal of solid, liquid and gaseous wastes, food and drinks management, nuisances, rodents, insect pests and general sanitation.
- Conduct research, studies and monitoring programmes related to environmental and food pollution and undertake and carry out all related surveys, monitoring and investigations and prepare the necessary reports, plans and programmes.
- Promote the planning, approval, funding and implementation of measures designed to ensure the wise and safe use of the environment
- Keep abreast of technological and other advances in the field of environmental health and initiate the updating of legislation, standards and procedures in this connection.

The Act also requires the Chief Medical Officer and the Chief Environmental Health officer to maintain constant consultation with other departments of government ministries or agencies that are responsible for matters related to environmental health. The act provides for the establishment of a Board to advise the Minister. No such Board has ever been appointed. The appointment of the Board could serve as an inter-sectoral mechanism to support the activities of the Environmental Health department.

In terms of regulations governing the Act, these have been developed by the Department of Environmental Health. However, the regulations are still being reviewed by the Ministry of legal affairs and thus have not been ratified and adopted by government. Regulations provide for minimum standards with respect to pollution hazardous and noxious chemicals. However the absence of regulations hampers the ability of the department to enforce the laws.

Approaches & Procedures for Enforcement and Monitoring

There are a number of government agencies with responsibilities for monitoring the impacts of Persistent Organic Pollutants on human health and the environment. These agencies operate under separate legal frameworks some of which lack basic regulations for implementation of the various Acts. This poses problems in terms of implementation.

Quite apart from this, as evaluated above, there are financial, human and physical constraints to achieving the monitoring objectives. This has serious repercussions with respect to the impacts on human health and the environments and as such, must be treated with some level of urgency.

Problems Identified:

- Pesticide manufacturers and traders need to demonstrate more accountability and responsibility for providing safer pesticides for farmers and householders;

- There is insufficient technical capacity at the public and private sector levels for assessment of chemicals for evaluation of applications for the registration of new pesticides;

- Storage of pesticides is a perennial problem. Reports indicate that for most storage areas,

there is inadequate ventilation. This requires ongoing training and constant monitoring to ensure that standards are met. The PCB requires at least two other officers for effective monitoring. The legislation and required regulation are in place but must be upgraded to support any framework that has been put into place. Legislation to update the pesticide Act and to put regulation on storage, use and handling is still in the draft form;

- There is no effective system for monitoring pesticide use at a national level, especially at the farming level, because of limited capacity. There must be ongoing training in methods for safe application of pesticides by all users;

- Determination of pesticide residues is evaluated outside of Dominica at the Caribbean Environmental Health Institute (CEHI). However, when transporting samples, they sometimes become contaminated thus affecting the outcome;

- Research and monitoring of the effects of pesticide on the environment is minimal to non-existent because of shortage of human and financial capacity and inadequate equipment and facilities;

- There is indiscriminate disposal of pesticide containers;

- Pesticide users especially the farmers still do not appreciate the need to use at all times- protective gear- respirators and protective clothing;

- At the supply level there is a need for an improved inventory and storage system- first in first out to reduce the volume of expired products;

- Most suppliers of pesticides do not keep records of sale, quantity and list of persons to whom the chemicals are sold as required under the regulations;

- Users are not aware of the nature of the real hazards of pesticides;

- Disposal of toxic waste needed serious attention;

- Absence of national standards and development of benchmarks to assess improvements in the management and handling of pesticides at all levels.

2.3 Assessment of Pesticides, Related Substances and Hazardous Materials and Wastes

Persistent Organic Pollutant Pesticides

Of the nine Persistent Organic Pollutant pesticides assessed in the Farm-Seller-Hotel Survey of February 2006, one container of mirex (0.5L) was identified at one farm and 0.25 L containers of aldrin at two hotels/guest houses. Persistent Organic Pollutant pesticides have not been imported nor used in Dominica for over 20 years and the limited number of containers may have been brought into the island illegally. DDT has not been used in Dominica since the 1970's, when it was employed in a programme to control the *Aedes egypti,* mosquito vector of malaria.

To control malarial mosquitoes, DDT has been replaced by two alternative products, fenthion (Abate) granules and malathion liquid (which is mixed with diesel oil for fogging operations). In draft legislation (bill to provide for *Pesticides and Toxic Substances Control*), the nine pesticides

included Group 1 of the Persistent Organic Pollutants are listed as Prohibited Pesticides and Toxic Chemicals, thus effectively precluding their future importation and their use.

Polychlorinated biphenyls (PCB)

The Farm, Stores and Hotels Inventory indicated PCB occurred in the industrial sector as dielectric fluid of large transformers used by the electric utility, DOMLEC. This company owns the large transformers at its generating plant, as well as others at various distribution points and on the premises of some business houses.

There are approximately 725 transformers in use around the island, of which about 14 (approximately 2%) contain PCB. This low percentage is the result of a policy of the company to reduce the number of PCB-containing equipment.

The dielectric fluid in de-commissioned transformers is tested for PCB before the oil is drained and the old transformer is discarded. These field tests are conducted using a CLOR-N OIL 50 test. Of a total of 12 old transformers tested in January 2006, all showed a PCB level of less than 50 ppm, indicating the oil was acceptable for disposal as non-PCB containing oil.

The oils from such transformers are placed in storage tanks to await disposal while the discarded transformers remain in their original locations. In the past, some of these discarded transformers were given to a local engineering company for recycling of the core. Arrangements for regular disposal of the PCB-containing oil are yet to be made.

One shipment of non-PCB transformer oil, mixed with used motor oil, has been made to Trinidad, where facilities for disposal exist. This shipment was made through an informal arrangement between DOMLEC and Autotrade Ltd. Plans are under consideration for the possible bulk collection and shipment of de-commissioned transformers and capacitors by an external contractor for appropriate disposal.

Other Pesticides and Related Substances

No other pesticides or hazardous materials are produced locally.

A wide range of pesticides are used in the agricultural sector and in domestic pest-control services. Some of the imported substances fall under Class 1A and Class 1B (Extremely hazardous / Highly hazardous) groups); e.g., paraquat (Gramoxone), diquat (Reglone), methomyl (Lannate), oxamyl (Vydate), and diphacinone (Ramik).

Some of the more commonly imported pesticides that are not Persistent Organic Pollutants include, of which Vydate, Gramoxone, Primicid, Round-up, Touch-down, Baygon and Basta are the most commonly used.:

- Vydate
- Basta
- Gramoxone
- Primicid
- Round-up
- Reglone
- Calixin
- Tilt
- Padan
- Fastac
- Gramocil
- Glifomax Fertilizers,
- TC Insecticide (Cyper TC)
- Tambo
- Diazinon
- Malathion

- Baygon
- Bop
- Touchdown
- Lannate
- Orchard Oil (banana spray oil)
- Benomyl
- Neozil (fungaflor)
- Cypro
- Admire
- Kocide
- Elsan
- Sevin
- Actellic
- Manzate
- Liquid detergent

Major suppliers include 4D Ag-Sales, Dominica Banana Producers Limited (DBPL), Agri-sales Services, Fagan Bannis, City Drug Store and Astaphan's (department store).

Bananas form the agricultural commodity for which the largest proportion of pesticides is used. However, because of restrictions on pesticide usage imposed as part of purchasing guidelines by EUREP-GAP and Fair Trade Organization, only a narrow range of insecticides, herbicides and fungicides are recommended on the producing farms. Particular restrictions are placed on the use of the herbicides paraquat (Gramoxone), glyphosate (Round-up, Touchdown) and glufosinate ammonium. Fair Trade also requires buffer zones between the nearest points of application and any rivers that occur on the farms.

Within the agricultural sector, there are several pesticides used in vegetable and fruit farms. Unlike bananas, there is no similar mechanism to regulate pesticides use in vegetable production, and monitoring systems for toxic chemical usage are much less developed, although the need is equally great.

Assessment of Hazardous Material and Wastes

There a number of other hazardous wastes: (a) used lead vehicle batteries; b) used motor oils; (c) biomedical wastes from hospitals and clinics; and (d) industrial contact waters and chemical containers.

Used lead acid (vehicle) batteries may be found at various business places specializing in such items, including vehicle repair establishments. These used batteries are most commonly disposed with other garbage at the Fond Cole Solid Waste Landfill or previous landfills for Roseau and Portsmouth. Examination of the Jimmit Solid (Metal) Waste Facility, indicated numerous batteries stored in a shipping container and others as residual metal hulks, the remains after the plastic covering was burned. There is no registry of the numbers of batteries imported as either replacement batteries or as part of the vehicle purchase. There is no arrangement for the collection, re-processing or disposal of vehicle batteries.

Substantial volumes of used motor oils are generated annually. In 2001, the amount was estimated as 460,000 litres and it is expected that this volume has increased, concurrently with the increase in individual motor vehicles. Comment from to date. But while large amounts could be stored in storage tanks at the Dominica Solid Waste Management Corporation (DSWMC), there is no formal system of oil collection and disposal. Collection for bulk shipment to a Trinidad disposal facility is under consideration, but capacity for short-term storage at service stations, collection to a central holding facility and shipment to Trinidad are expected to require significant investment and a mechanism for cost retrieval. Waste oil generators include most of the 27 vehicle service stations, 6 vehicle distributor/sales centres, several large trucking and construction companies and DOMLEC. Except for PCB-contaminated fluids which need special handling, disposal of waste oil is mostly casual use of drains, with the resultant environmental

pollution.

Biomedical wastes are collected by the Dominica Solid Waste Management Corporation collection system. At present, these hazardous wastes are buried at the landfill. The earlier system of incineration in a kiln at the hospital has been discontinued for some years. A new, modern gasification unit is under installation at the general hospital and this is expected to become operational by mid-2006.

Waste disposal at some private industries importing chemicals for manufacturing businesses is inadequate and requires improvement. One such business is the local paint manufacturer, Harris Paints, which imports various acids as well as antibacterial, antifungal, algaecidal and aromatic compounds in cans and other containers including drums. These empty containers, their rinsates and other rinsates from the manufacturing operations pose a waste disposal problem. These rinsates find their way into the nearby drain and Boeri River. Old drums also find their way into farms where they may store water used for application of herbicides or other pesticides.

In the banana industry, disposal of waste fungicides used in post harvest treatment of the fruit is controlled by the use of dedicated charcoal-lined pits into which the excess mixtures are emptied, on-farm. This process was recommended by the Fair Trade Organization, but no testing of the efficacy of the traps has been conducted, nor is there any information on whether farmers pour residues of pesticides other than the fungicides.

2.3.4 Knowledge of Stockpiles and Contaminated Sites, Wastes, Identification, Remediation Measures and Data on Releases

Persistent Organic Pollutants

No stockpiles of persistent organic pollutants exist on Dominica. There is no “baseline” of concentrations or distributions of Persistent Organic Pollutants in the soils, sediments, fish, vegetation, river waters or marine waters of Dominica.

To address the gap in knowledge regarding residual concentrations of Persistent Organic Pollutants in agricultural soils, soils from 17 farms, representing a range of farm types and with full distribution throughout Dominica, (see additional information in Appendix A4-4) were tested for a suite[2] of organochlorine pesticides and polychlorinated biphenyls. Only three farms were found to contain detectable amounts of DDE/Dieldrin; concentrations of all other pesticides and PCB were less than minimum detection limit. The second part of the baseline survey, entailed sampling fine-grained (i.e., materials most likely to accumulate pesticide residues) from 13 rivers (see Appendix A4-4). No detectable concentrations of any of the pesticides or PCB were found in any of the river sediments. This was not an unexpected result, as Dominican rivers are very fast flowing, with limited areas of sediment accumulation and are also subject to significant bedload movement during major rainfall events. The third part of the survey entailed sampling of soils near leachate areas of the former Portsmouth and Roseau landfills. Of these three samples, one sample from near the former Roseau Landfill at Stock Farm was found to contain DDE/Dieldrin, but no detectable amounts of other pesticides or PCB. The fourth part of the

[2] The suite of organochlorine pesticides tested included (Persistent Organic Pollutants are underlined) (a-BHC, b-BHC, g-BHC (Lindane), d-BHC, hexachlorobenzene, heptachlor, aldrin, heptachlor epoxide, endosulfan I, endosulfan II, dieldrin, endrin, 2,4'-DDE, 2,4'-DDD, 2,4'-DDT, 4,4'-DDE, 4,4'-DDD, 4,4'-DDT, endrin aldehyde, endosulfan sulphate, endrin ketone, chlordane, mirex, toxaphene and methoxychlor.

survey entailed taking soil samples from the Jimmit Solid Waste Facility of DSWMC, which was set up to handle and "temporarily" store metal wastes. However, this facility receives a variety of materials ranging from tires to car lead batteries. There was evidence of past fires on the site and examples of plastics and other materials being burned. Of two samples taken, both showed evidence of several pesticides and PCB. The latter is of particular concern, as the samples were taken in areas of evident burning of wastes. The fifth part of the survey entailed collection of mullets, a lipid-rich small fish, collected in three rivers along the west coast of Dominica and representing drainage from three agricultural areas. All fish samples showed evidence of pesticide contamination, including residues of several Persistent Organic Pollutants.

No data on release of PCDF's and PCDD's into the atmosphere are available. However, some activities that are known to release these substances have occurred in the past and are likely to be occurring at this time. These activities included the open-barrel burning of used diothene fungicide bags in the banana industry, burning of wastes at dump sites such as Jimmit, burning of used tires (a current method of tire disposal), and the bush fires occurring in the dry season.

Other Pesticides and Related Substances

Because of the limited volumes of chemicals routinely purchased by farmers, stockpiles on the farms are not likely to occur. However, pesticide suppliers are likely to store significant amounts of pesticides that have expired as a result of slow sales among other reasons. One such supplier was the defunct Dominica Banana Marketing Corporation (DBMC), the residual pesticides are currently stored in a government warehouse at Canefield (River Estate warehouse), the following stockpiles were found:

Table 2.3-1. Stockpile at Warehouse, River Estate, Canefield

Common Name	Trade Name	Chemical Name	Chemical Group	Amount
Actellic 5CS		Pirimiphos-methyl	Organophosphate	60 L
Hexaconazole	Anvil 25SC	Benzimidazole	Triazole	725 L
Benomyl	Benlate		Benzimidazole	100 kg
Dicofol	Kelthane	2,2,2-trichloro-1,1-bis(4 chloro -phenyl) ethanol	Organochlorine	4,090 L
Avamectin	Vertmec		Pyrethroid	360 L

A contributing factor to the build-up of such stockpiles is the lack of facilities for appropriate disposal of pesticides and other hazardous materials on Dominica. This is one of the main reasons for the existence of a small stockpile at a local supplier, Agrisales Ltd., which inherited some expired products (Table 2.3-2) but require assistance for their safe disposal.

Table 2.34-2. Stockpile at Agri-sales Services

Common Name	Trade Name	Chemical Name	Chemical Group/ Use	Amount
Fluazifop	Fusillade Super	2- [4-(5-trifluoromethyl–2-pyridyloxy) phenoxy] propionic acid	Selective post-harvest herbicide	12 L
BONIDE Mosquito Beater	Mosquito Beater	Naphthalene + Beta – butoxy Beta thiocyano diethyl ether + Butoxy polypropylene glycol	?	3.64 kg

There are several mechanisms that can result in the direct or indirect release of chemicals. Release can be examined by investigating the number of spillages reported, the methods used to dispose empty containers and the contaminated waste sites. Four percent of the survey enumerators reported seeing signs of spillage in the farmers' storerooms; the Dominica Solid Waste Management Corporation mostly collects the empty containers (30%).

However, at least eight percent of surveyed farmers bury empty containers at the edges of farms, ten percent place their garbage in empty containers, one percent of farmers take back empty containers to the suppliers and a small number (0.3 percent) disposes of the used containers into the river (such disposal was reported in one district only).

2.3.5 Summary of Future Production, Uses and Releases

Persistent Organic Pollutants

No Persistent Organic Pollutants are likely to be produced in Dominica in the near or medium-term, nor are any of these substances likely to be used again.

Future releases of PCDF's and PCDD's may continue at low levels as bush fires occur and as burning of waste continues, particularly of large numbers of old tires. Burning of garbage and household waste is expected to diminish as public awareness increases.

Other Pesticides and Related Substances

The use of other pesticides in the agricultural sector is expected to continue at current levels, especially in the main export crop of bananas where optimal productivity and quality have become watchwords for economic survival. The use of pesticides in non-export production of vegetables will decrease over the next 5-10 years as stricter control mechanisms are put in place, and as the current movement towards organic production gains momentum.

Presently, there is a great reliance on pesticides and related chemical substances by a large number of farmers, as reported in the Farm-Stores-Hotels Survey: (31) of various pesticides in use (12 pyrethroids, 8 organophosphates, 6 carbamates, 5 mixed types including mirex, a Persistent Organic Pollutants). Eleven percent of farmers interviewed island-wide believed that over the years, the usage of chemicals has increased. This view contrasts with the known reduction in the spectrum of pesticides (especially organophosphates and carbamates) that had been used in the banana industry in which acreage has been reduced to less that 30% of what it

was. However, in the Parish of St. Andrew, where the largest number of farmers was interviewed (338 farmers), 12% of them reported an increase in the use of chemicals, thus reflecting the overall view.

Seventy-one percent of the surveyed farmers using these pesticides have acquired some information on how to handle these substances (handling, storage and safety methods). Their selection of chemicals are based mainly on advice from the agriculture extension officers (41% of farmers use this advice).

A fairly large number of farmers reported protecting themselves when using pesticides. Seventy-nine percent of farmers reported wearing protective gear when handling chemicals and 48% have undergone some degree of training on how to handle these substances.

2.3.6 Existing Programs and Findings for Monitoring Releases

Persistent Organic Pollutants

No programs currently exist for monitoring the release of Persistent Organic Pollutants.

Other Pesticides and Related Chemical Substances

No programmes exist for routinely monitoring the release of pesticides or other chemical hazards and relating this to effects on the environment, including humans. The Environmental Health Department undertakes weekly sampling of water (at the intakes, above the storage tanks, after treatment, and from drinking water pipes) for monitoring levels of phosphates, nitrates, sulphates, phosphorus and chlorine, etc., in drinking water. Some specific analyses of water or fish may be requested of the Caribbean Environmental Health Institute (CEHI) where pesticide incidence is suspected.

Very little environmental research for the presence of pollutants has been undertaken in Dominica.

Five percent of the 1146 farmers surveyed and 16% of the 118 suppliers reported health problems. However, it may prove difficult to correlate some of the reported illnesses to exposure or handling of the chemicals.

There was no empirical evidence from the data collected in the survey to support a case for the environmental impact of any chemicals. A comprehensive method needs to be developed to directly link reported cases of illnesses to any exposure to these chemicals. This would involve the active participation of the Health Clinics, Hospital and local doctors in systematically documenting reported illnesses in the farming families, suppliers, manufacturing businesses and housekeeping sections of the hotel business. Such involvement could be spearheaded by the Environmental Health Department of the Ministry of Health.

Hazardous Materials and Hazardous Wastes

No programmes exist for routinely monitoring the release of hazardous materials and hazardous wastes and relating this to effects on the environment, including humans.

2.3.7 Current Level of Awareness and Education of Target Groups; Existing Systems to Communicate Information

There is limited information and knowledge regarding the 12 Persistent Organic Pollutants and limited knowledge regarding other hazardous chemicals by most "users", from those importers to the end users. As such, this poses a major national problem because of the risks associated with these pesticides and chemicals. It is therefore important to develop and implement a public awareness and information programme to inform and sensitize the suppliers, users and general public on Persistent Organic Pollutants and other hazardous materials and hazards and risks associated with banned products including stockpiles and with the use of permitted POP and other hazardous chemicals.

There are number of departments with existing public awareness programmes that can be utilized for this purpose as follows:

- Dominica Banana Producer Ltd.
- The Forestry, Wildlife and Parks Division
- The Fisheries Division
- The Ministry of Agriculture
- The Environmental Health Unit
- The Environmental Coordination Unit, ECU

All the public awareness programmes of these departments except that of the DBPL are under-financed. Most of them are funded under administrative programmes and are not given priority in terms of allocation of resources. This has been manifested in the inability to buy airtime or space from print media and to purchase the equipment for implementation. This has hampered the sustainability of the programmes. Presently all the programmes have been scaled down due to reducing financial resources. The programmes of the Ministry of Health and the DBPL are ongoing. They both have weekly radio programmes and Television programmes.

Evaluation of Existing, Education, Public Awareness and Communication Programme

Public Sector

At present, the Pesticides Control Board has no organized training programme for education and dissemination of information on any pesticide, including the Persistent Organic Pollutants. Prior to 1999, the Pesticides Control Board undertook a series of training programmes for suppliers and users of pesticides, including Persistent Organic Pollutants, as follows:

- Health and Safety
- Storage
- Repackaging and Labelling
- Emergency procedures for spillage of hazardous materials or pesticides

In addition, they held an annual pesticide awareness week where training programmes targeted all stakeholders over a period of time. This program had to be discontinued, due to budgetary constraints.

The Ministry of Agriculture through the extension officers provide ongoing training programmes in various agricultural practices that include safe handling and use of pesticides. However, there is no sustained or programmed educational activities specific to pesticide use and

management.

The Ministry of Agriculture has an information Officer heading a small information Unit. The Unit has the capacity for video production, but has no equipment for other public awareness programmes. Discussion with the information officer indicated that the Requirements of Unit are as follows:

- Equipment- soft ware sound card "cool edit programme"
- Public Awareness
- Video tapes
- Staffing

PRIVATE SECTOR- SUPPLIERS

The only organized training programme is that undertaken by the DBPL for farmers. More recently, in order to meet the requirements of Fair Trade and EUREP Gap, training of farmers has been intensified to get banana farmers knowledgeable on Fair Trade standards for pesticide use and other requirements to enable them to achieve certification. The organization is collaborating with the Ministry of Agriculture and the Pesticide Control Board to undertake further training programmes.

Recommended Public Awareness Campaign

In defining a national public awareness programme one should aim to increase awareness, and knowledge of Persistent Organic Pollutants and other hazardous materials, to develop skills and motivation for effective management and use of Persistent Organic Pollutants and other hazardous materials and to prevent future problems associated with handling, storage, use and disposal. The objectives of the programme should encompass some of the following:

- Information on Persistent Organic Pollutants and other hazardous materials
- Awareness of the hazards of dealing with pesticides other hazardous materials.
- A basic understanding of health hazards and pesticide use
- Identification of Problems
- Effective and practical management of Persistent Organic Pollutants and other hazardous materials- handling, transportation, labelling, record keeping and data base development
- Hazardous waste control- source reduction, treatment, recycling and disposal
- Propose alternatives
- Implement action- Do something
- Provide the tools to act

<u>Elements of a Proposed Public Awareness Programme</u>

Public awareness programmes should be spearheaded by the Pesticides Control Board, with joint responsibility of the Ministries of health, Agriculture, Solid Waste Management, Pesticide Control Board, DBDL, as well as the ECU. These departments should, in conjunction with the media, develop educational materials for use and widespread communication through a variety of media- TV, radio, Newspapers, seminars/workshops exhibition.

In conjunction with the Ministry of education, this should be incorporated into the social or science curriculum to educate school children.

Mechanisms to provide information to the public concerning the potential risks associated with all stages of the chemical life cycle.

Information to all stakeholders on legal instruments, policies, programmes and related activities to include public consultations should be put in place.

Any public awareness programme must, among other things, engage the public in recognizing that they have a responsibility for reducing the use and incidence of Persistent Organic Pollutants and other hazardous materials; e.g., the habit of open burning of garbage, especially the burning of plastics that produce dioxins as well as the burring of hazardous material- a campaign on barrel burning could be introduced.

- The need for full and complete public discussion of the issue of proper disposal of hazardous chemicals- What processes are now being implemented- incineration and non-incineration technologies as an acceptable technique for the destruction of Persistent Organic Pollutants.
- The role of the public in implementing the Convention needs to be acknowledged, including the concept of consumer responsibility. “We demonstrate commitment by our actions”. Efforts must be made to educate people that their own actions are leading to emissions of Persistent Organic Pollutants and other hazardous materials and wastes.
- Information The Rotterdam Convention-what chemicals are included, Prior Informed Consent , PIC procedure, The Stockholm Convention and GAP
- Importing countries responsibility/exporting country responsibility
- Local publications should be encouraged to include information on Persistent Organic Pollutants and other hazardous materials; this is a cost-effective way of educating the public. Outreach to schools can also be effective.
- Role of the Pesticides Control Board should also be highlighted
- Need to address the gap that exists between knowledge and practice- with respect to end-users. Users, especially the farmers who do not implement recommendations- protective gear, immediate washing of contaminated clothing, handling and storage-
- Sensitize farmers with the fair trade and Eurep Gap standards for use of pesticides
- Encourage public consultation- Introduce a public review process to obtain input form the public before registration of a pesticide that contains active ingredients that were not previously used.
- Publish fact sheets informing the public of the role of the Pesticides Control Board, the role of the public and of the manufacturers, traders or importers as set out in the regulations
- Publish standards related to the handling and use of pesticides
- Consider the role that public health units can play in educating the public about Persistent Organic Pollutants and other hazardous materials and human health and their ability to facilitate community involvement.
- Regional and international organizations like FAO and UNEP and WHO should be accessed for provision of educational material on these issues

<u>Target Audience</u>

- Policy and Decision Makers

- Importers- wholesalers, manufacturing companies, hospitals
- Distributors
- Commercial pesticide Applicators-pesticide management companies
- Users-farmers, hotel sector, Printing companies, Mechanics-refrigerant, air conditions, garages
- Handlers
- The public
- Women
- Children
- The Least educated /The illiterate

Methodology

The success of the awareness programme requires the full engagement, consultation and involvement of all the stakeholders in the process. This should be the guiding principle upon which to proceed.

The most effective methods for reaching identified target groups should be applied to include illiterate groups of people using approved adult literacy methods and principles

The following activities are recommended:

- National consultations- to ensure public/ private sector collaboration in the design, development and implementation of the programmes so as to integrate their skills, values and development plans into the process and to encourage "buy-in"-

- Inter-sectoral planning- Convene meetings with other departments of government engaged in public education and awareness programmes with the objective of integrating, a far as possible, the awareness programme and activities into existing complementary programmes of other relevant departments e.g. Village Councils, Fisheries, the Environmental Coordinating Unit, ECU, Forestry, the national UNESCO programme, Youth Environmental Corp, Ministry of Health' Healthy Village Programme", Adult Literacy Department

- Education and involvement of the wider public and stakeholders in management and development goals, objectives, plans and programmes of the Pesticide Control Board

- Working with the Ministry for Community Development, village councils, NGO's CBO's and community groups

- Utilizing existing adult literacy programmes and methodology

- Development of a programme targeting schools and youth with input from the Ministry of Education through the national consultation process.

- Utilization of a variety of media and communication channels for the dissemination of information to the various target groups. Weekly radio programmes/ TV programmes, newspapers articles, promos, production and use of a pesticide mascot, and organization of pesticide awareness events- Pesticide Day/ week etc.

Media and Communication Channels

- Radio and television spots- Public Service Announcements
- Jingles on radio and television people will hear and accept
- Mini television documentary
- Leaflets and fact sheets
- Radio and television
- Video
- Posters
- Use of theatre
- Establishment of "Pesticide Awareness Week" as an annual event
- Establishment of Quarterly " Household hazardous Waste Day" where households can take all hazardous waste – batteries, spray paints etc to a specific area for disposal

2.3.8 Relevant Activities of Non-Governmental Stakeholders

Discussions with the private sector indicate that there is no organized training programme. On-the job training of staff is undertaken occasionally, as well as training offered by overseas suppliers when introducing a new chemical or pesticide.

Evaluation of Training Needs and Identification of Training Needs by Sector

Farmers

Farmers are the persons who handle and use the largest quantity of pesticides. A survey undertaken indicated that there is insufficient training of farmers using pesticides. It indicated that the selection of chemicals used is usually based on the advice of the agricultural extension officers and the Dominica Banana Producers Ltd. DBPL.

Results of the survey indicated as follows:

- 550 out of 1146 or 48% of farmers obtained training;
- 900 or 79% wore safety gear and 813 or 71% received the MSDS sheets from the suppliers.

Hotel Sector

The survey results from the hotel sector (59 interviewed) indicated as follows:

- 17% received training in the use of pesticides;
- 17 % wore safety gear;
- 15% received MSDS from suppliers;
- 14 % made this information available to employees using the pesticide;

Suppliers

Of the 117 suppliers interviewed, the survey indicated as follows:

- Only 21or 18 % were trained;

- 23 or 20% wore safety gear;
- 16 or 14% had any MSDS on chemicals;
- 10 or 12% provided customers with MSDS sheets

The Major suppliers include DBPL, 4D Ag Centre, Agri Sales & Services, Fagan Bannis, City Drug Store and J. Astaphan & Co. Ltd.

These findings have serious implications with respect to the monitoring activities carried out by the Pesticides Control Board and other monitoring agencies, the observance and implementation of the pesticide act and relevant regulations with respect to licensing of suppliers and the requirements and responsibility of suppliers to consumers as spelt out in the regulations.

It also provides information with respect to future management, training and development of public awareness programmes to sensitize and educate users and suppliers with respect to handling, storage and safe use of pesticides

2.3.9 Overview of Technical Infrastructure for Assessment, Measurement, Analysis, Alternatives and Prevention Measures

TABLE 2.3.9-1: Testing capabilities for National Centre of Testing Excellence

Laboratory	**Proposed Testing**
Microbiology Lab- Food, Potable water, Recreational water	Total coliform Faecal coliform E coli Heterotrophic Plate Count Staphylococcus aureus Yeasts & Moulds Total aerobic plate count Salmonella species Biological oxygen demand (5-day)
Analytical Chemistry Laboratory	Chemistry analysis of food including nutritional analysis. This will include Calories Fats including saturated fats Protein Sugar Sodium Dietary Fibre Carbohydrates Vitamins (A & C) Soils BTEX, TCLP, N, P, K COD, pH. Temperature, Turbidity Metals Oil & grease
Physical Testing Laboratory	Testing for dimensions and volume Testing of packaging material
Calibration	Dimension, Mass (balance/scales) Temperature Pressure Stop watches

2.3.10 IDENTIFICATION OF IMPACTED POPULATION OR ENVIRONMENT, ESTIMATED SCALE AND MAGNITUDE OF THREATS TO PUBLIC HEALTH

Introduction

The pesticides (both organic and inorganic) available in Dominica are mostly imported for agricultural purposes; Dominica does not produce or manufacture any type of pesticide. The total quantity of pesticides imported into Dominica during the period 2000-2005 was 1,749,912 kg, for an annual average of 291,652 kg, valued at EC $2, 744,267 (US $1,020,174). However, the annual average "hides" the fact that during this period, the quantity of pesticides imported decreased by 66% from 631,567 kg to 216,850 kg, with the most significant decrease occurring between the reporting years of 2000 and 2001.

Pesticides In Use

Table 2.10-1 shows the 11 most heavily used pesticides in Dominica during the last eight years. It should be noted, however, that five of these have not been imported since 2000. Gramoxone (paraquat-based herbicide) and Vydate (oxamyl-based insecticide), are the two most-commonly used pesticides. It is interesting to note that although active acreage of banana decreased by 75% during the last six years, the quantity of imported Gramoxone was reduced only by 3%. In fact the average importation of Gramoxone during the period 2000-2005 is 10% more than the base year 2000, indicating a more wide-spread use of the herbicide for vegetable and fruit crops.

The importation of the other major pesticides tends to fluctuate from year to year. It is interesting to note that two of the pesticides most widely used are not on the list of agro-chemicals approved for the production of "Fair Trade Bananas"; see Table 2.10-2.

Table 2.10-1: List of Most Widely Used Pesticides in Dominica 1998-2005

Pesticide	Unit	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
	Kg or Litres										
Gramoxone	L	39,412	65,656	53,584	14,738	7,549	25,003	26,212	9,384	14,420	255,958
Vydate	L	24,054	34,920	21,534		8,788		7,892	7,526	224	104,938
Mocap	Kg	19,440	59,414	19,440	1,296	***No longer imported***					99,590
Reglone	L	7,528	14,760	22,392	5,689	1,291	3,010	4,251	3,606	296	62,823
Gramocil	L	6,252	11,952	21,360	2,664	924	842	280	864	432	45,570
Roundup	L/Kg	8,352	2,889	5,240		18	150	161	840	473	18,123
Regent	Kg		17,640	***No longer imported***							17,640
Miral	Kg		11,490	***No longer imported***							11,490
Touchdown	L		432	2,104		72	2,806	1,296	1,728	1,644	10,082
Sigma	L		5,800	1,400	***No longer imported***						7,200
Tilt	L		960	3,960	***No longer imported***						4,920

Table 2.10-2: Pesticides approved for use by the Dominica Fair Trade Association (Banana)

Activity	Trade Name	Common Name
Herbicides only with written permission and only against water grass (maximum of 3 times a year)	Basta	Glufosinate of Ammonium
	Touchdown	Glyphosate
	Round up	Glyphosate
Nematicides only with written permission.	Vydate	Oxamyl
	Furadan	Carbofuran
Insecticides	Regent	Fipronil
	Liquid soap detergent	
	Vertimec	Abamectin
	Torque	Fenbutalin
	Basudin	Diazinon
	Actellic	Pirimiphos-methyl
	Neemex	
	New mectin	
Fungicide	Neozil, Fungaflor	Imazalil
	Calixin	Tridemorph
	Benlate OD	Benomyl
	Sigma	Thiophanate-methyl
	Anvil	Hexaconazole
	Vectra	Bromuconazole
	Tilt	Propiconazole
	Bankit	Azoxystrobin
	Petroleum oil	
Molluscides	Mesural	Methiocarb
	Metaldahyde	Metacetaldehyde
Disinfectant "Moko Disease**"**	Formalin, Formaldehyde	Trioxytrimethylene

Impacted Population

The population of active farmers has dwindled considerably during the last decade. In 1995 the number of active farm holdings was 8,434 with more than 4,366 farmers managing these holdings. By 2005, this number had dwindled to 880. More than 72% of these farm holdings used various pesticides, while 79% used synthetic fertilizers. The impacted population on these farms includes the farmers, farm workers, households and the individuals actually involve in the distribution of these chemicals.

By 2005, the total number of individuals employed on the farms was almost 3,000 or less than 20% of the amount employed in 1995. In addition to the farm workers there are members of the family, wives and children, who are exposed to farm pesticides (in 1995 was over 26,000; National Agricultural Survey, 1996). While there has been a decline both in numbers of farms and agricultural workers, the quantity of pesticides imported during the period 1995-2005 has not declined proportionately, implying: (1) a larger quantity of the pesticides are being used by smaller number of farms to maintain productivity; and/or (2) more of the pesticides are being applied to crops for which the pesticides have not previously been used; e.g., root crops, plantain, etc.

Increasing biocide exposure

As the demand for agricultural products increases and the supply of farm labourers decreases (increase urbanization and migration) farmers tend to rely more on the use of chemicals as a strategy to reduce cost (e.g., weed control) and meet market demand. A study conducted on agro chemical exposure in St. Vincent and the Grenadines and Antigua-Barbuda revealed that farmers prefer to use pesticides rather than labourers, since they are often cheaper and more reliable (Andreatha, 1998). The increase in the use of these chemicals also tends to provide an increased potential for pesticide residues in farm products.

Farmers in Dominica seem to be quite knowledgeable in the proper use of the pesticides. However, in practice, very few farmers use any protective equipment when applying the pesticides, primarily due to complaints related to heat and humidity. In addition, the cost may sometimes prevent farmers from using them, especially when extra farm labourers are employed. The labourers are therefore expected to look after themselves.

In cases where children assist on the farms it is not uncommon to see them running through the grass or weeds just sprayed with herbicide.

In addition not even the wholesalers or retailers tend to handle the chemicals properly. At one major distributor where the chemicals are repackaged into smaller affordable parcels for resale it was observed that the shop attendant was not using gloves or protective devices.

Land use in some of the water catchments area includes cultivation on steep slopes of such crops as: vegetables, root crops, bananas, settlements and small copra farming. In one particular area in the north east one of the large farmers admitted that whenever he is replanting his field “the entire village gets diarrhea”. The water intake of that community was then in that farmer’s banana field. Although the intake is now in the forestry reserve area, the case is worthy of mentioning since it highlights the potential effects of pesticide use.

Impact of Pesticides Used on Human Health

In a survey conducted by the ECU in 2006 among 1500 farmers 5% reported illnesses ranging from hand irritation to vomiting, abdominal pain, headaches, runny nose or dizziness which they perceived to be pesticide related (Abeo Trotter, 2006).

Further not all insecticide ear mark for banana plantation find their way into the banana farms. A study conducted in the Windward Islands on the use of agro chemicals revealed that some of these chemicals are applied to other food crops such as tomatoes (Andreatta 1998). Farmers have reported using premicid with residual effects of over six months on short term crops. These pesticide contaminated crops then their way into the market for sale. As one farmer admitted he will not eat cabbage he sells to the market and as a result produce his own crop for home use.

Some illnesses resulting from pesticide use according to Thrupp (1995 and EE CR/1994) include men suffering from loss of their reproductive capacity (low sperm count and even sterility) from pesticide exposure. Women have also suffered miscarriages, infertility, problem pregnancies and deformed and mentally retarded infants as a result of exposure to toxic biocides (Andreatha 1998).

Neoplasm and Pesticide Use

Several studies have established a relationship between cancer and the use of pesticides. While there have been no studies in Dominica on cancer related deaths or illness information from the Health Information Unit revealed that the number of cancer related deaths in Dominica has increased by more than 150% during the last 15 years.

Cancer was responsible for over 20% of all deaths during the period 1992-1995 and was one of the three leading causes of deaths. During 1996-2000 more than 29% of all deaths in Dominica were cancer related and this increased to an alarming 34% during the period 2001-2004.

The five major types of cancer in Dominica during the last 15 years, according the health information unit were digestive organs, stomach, prostate, breast cancer and cancer of the cervix. The table below shows the types of cancer related deaths in Dominica since 1988.

Gender and reported cases cancer

More than 69% of all cancer cases reported in Dominica since 1988 was men. Prior to 1994 the amount of female and male cases reported was even. However since 1994 the number of male cases reported increased twice as fast as female cases with prostate and stomach as the leading types.

District and reported cancer cases

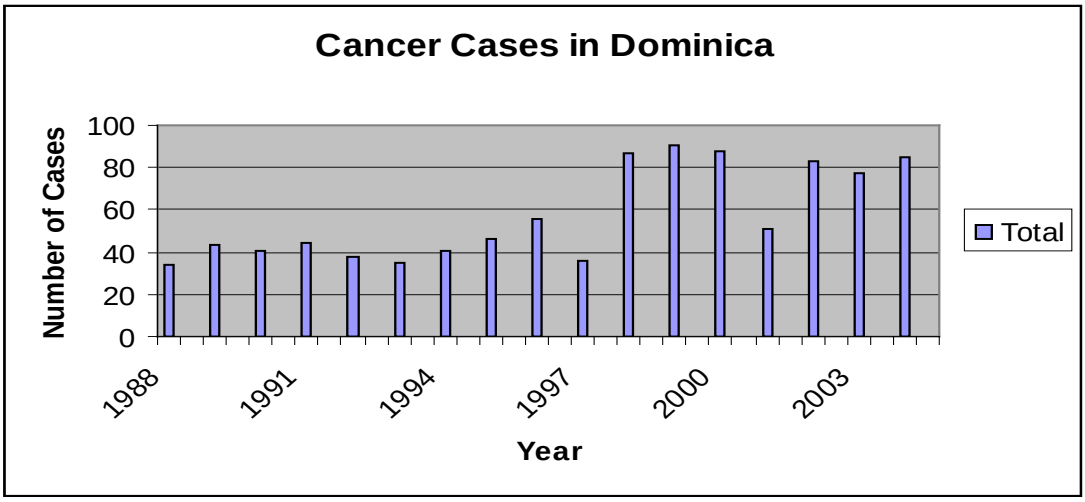
More than 50% of all cancer cases reported during the period 1996-2000 was from Roseau and Portsmouth the least cases were reported from the leading agricultural districts of Marigot, Castle Bruce and La Plaines In fact only twenty cases were reported from Castle Bruce and 35 and 40 from the Laplaine and Marigot districts respectively during that period (see Table 2.10-3). To establish the connection with the use of pesticide however further studies will be required.

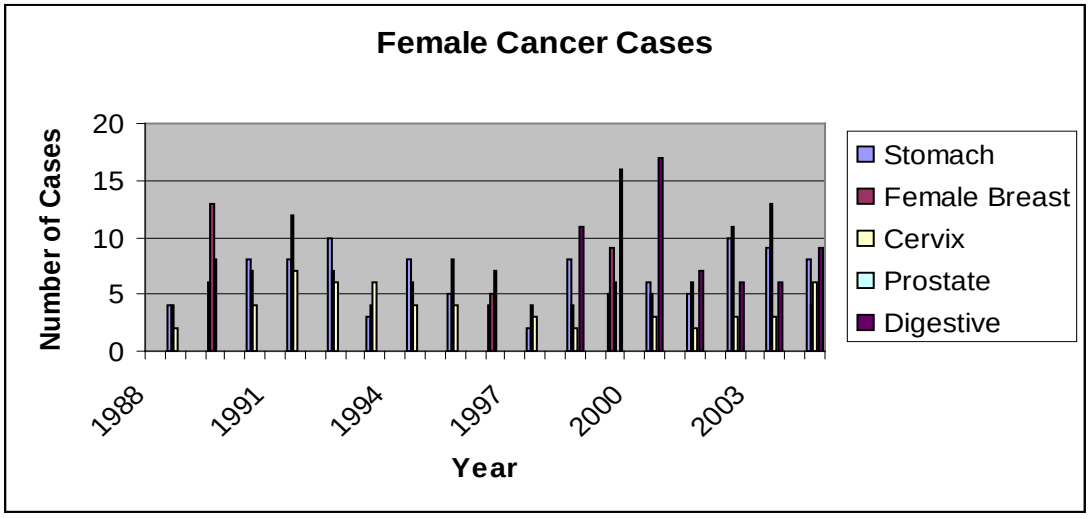
Table 2.10-3: Cancer Cases in Dominica (1988-2004)

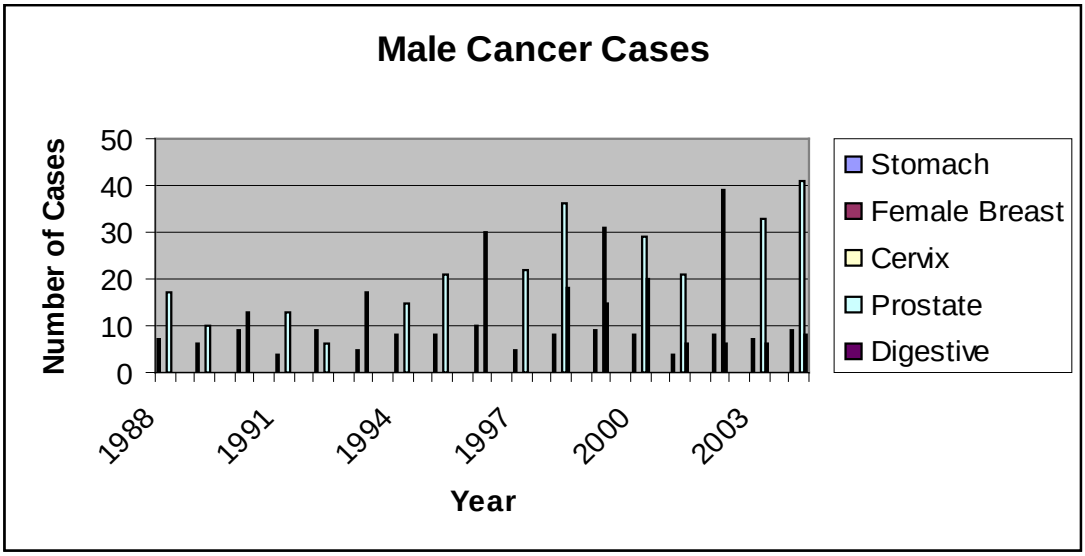
Year	Gender	Stomach	Female Breast	Cervix	Prostate	Digestive	Gender Total	Total
1988	M	7	0	0	17	0	24	34
	F	4	4	2	0	0	10	
1989	M	6	0	0	10	0	16	43
	F	6	13	8	0	0	27	
1990	M	9	0	0	13	0	22	41
	F	8	7	4	0	0	19	
1991	M	4	0	0	13	0	17	44
	F	8	12	7	0	0	27	
1992	M	9	0	0	6	0	15	38
	F	10	7	6	0	0	23	
1993	M	5	0	0	17	0	22	35
	F	3	4	6	0	0	13	
1994	M	8	0	0	15	0	23	41
	F	8	6	4	0	0	18	
1995	M	8	0	0	21	0	29	46
	F	5	8	4	0	0	17	
1996	M	10	0	0	30	0	40	56
	F	4	5	7	0	0	16	
1997	M	5	0	0	22	0	27	36
	F	2	4	3	0	0	9	
1998	M	8	0	0	36	18	62	87
	F	8	4	2	0	11	25	
1999	M	9	0	0	31	15	55	91
	F	5	9	6	0	16	36	
2000	M	8	0	0	29	20	57	88
	F	6	5	3	0	17	31	
2001	M	4	0	0	21	6	31	51
	F	5	6	2	0	7	20	
2002	M	8	0	0	39	6	53	83
	F	10	11	3	0	6	30	
2003	M	7	0	0	33	6	46	77
	F	9	13	3	0	6	31	
2004	M	9	0	0	41	8	58	85
	F	8	4	6	0	9	27	

Table 2.10-4 Cancer cases by districts

District	1996	1997	1998	1999	2000	Total
Castle Bruce	4	5	4	6	3	22
Grand Bay	10	9	11	16	13	59
St Joseph	16	14	11	12	5	58
La Plaine	9	3	2	13	8	35
Portsmouth	17	13	19	16	16	81
Marigot	9	8	12	4	7	40
Roseau	32	23	42	52	57	206
Total	97	77	101	119	109	503






Male Cancer Cases
Number of Cases
50
40
30
20
10
0
1988
1991
1994
1997
2000
2003
Year
Stomach
Female Breast
Cervix
Prostate
Digestive

3. STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN

3.1 INTRODUCTION

The overall goal of the NIP is to meet the obligation of the Stockholm Convention with respect to Persistent Organic Pollutants issues and outline how Dominica will meet its obligations. In addition, the Dominica NIP will also have the goal of facilitating the establishment of a system for the environmentally-sound management of Persistent Organic Pollutants and other hazardous materials and hazardous wastes, pesticides and related substances, various industrial chemical substances, ozone-depleting substances and chemical weapons. The NIP will provide concrete actions in support of Dominica having become Party to several key Conventions, in addition to the Stockholm Convention, that are related to management of chemical substances.

To assist in developing the Action Plan component of the NIP, the Environmental Coordinating Unit of the Ministry of Agriculture, Fisheries and Environment (MoAFE) undertook an extensive series of stakeholder consultations (see information and lists of attendees in Appendix A-2), both in Roseau (five meetings) and in five rural communities (Marigot, Salisbury, Portsmouth, Grand Bay and La Plaine). The consultations in Roseau provided a review of the National Profile Report, a review of the key elements required in the Action Plan, use of risk and risk management to set priorities in the Action Plan and a detailed review and discussion of the draft NIP. The community consultations were more focused on the elements comprising the proposed Action Plan. The meetings in Roseau typically attracted over 60 participants from a wide spectrum of interests; the meetings in the communities attracted about 20-60 participants each, primarily farmers. Information gathering meetings were held with major suppliers of chemicals, DOMLEC (electric utility), Physical Planning Division (Ministry of Lands), the Dominica Port Authority and Dominica Customs and Excise Division. There were specific separate meetings with Agriculture Extension Officers, staff of the Dominica Banana Producers Association and Forestry Division staff to discuss the proposed Action Plan.

As part of the Enabling Activity Project, the Government appointed a National Coordinating Committee (NCC), with a membership specifically selected to ensure representation across a spectrum of stakeholder interests (see information in Appendix A-2). The NCC met three times in the January to May 2006 period and provided detailed commentary on the initial focus of the project (i.e., extending the project from just Persistent Organic Pollutants to include all other pesticides and hazardous materials and hazardous wastes), the development of the National Profile and the elements of the Action Plan.

Another element of the Enabling Activity Project was the assessment of existing conditions in Dominica, with respect to the Group 1 Persistent Organic Pollutants and other pesticides. As described elsewhere in this report (see discussion in Chapter 2 and further information in Appendix A-4), 1178 farms, 117 retail sales outlets and 58 hotel/guest houses were surveyed to obtain information on pesticides being used now and in the past, the scope of stockpiles of pesticides by type and quantity and the general awareness of safe handling and use of pesticides. The survey identified one bottle (0.5L) of mirex and two bottles (0.25L each) of aldrin and that less than 2% of the 714 electrical transformers contained polychlorinated biphenyls (PCB). While not specifically surveyed, there are numerous older fluorescent light fixtures in use in Dominica and the fixture ballasts are likely to be “PCB contaminated” ballasts.

The farm survey did indicate the extensive use of various pesticides, mostly glyphosate, paraquat and carbamate based materials. The surveys also indicated varying concerns with a spectrum of other hazardous materials and hazardous wastes.

The survey was supplemented by analysis for the nine Group 1 Persistent Organic Pollutant pesticides and PCB of soils from 14 banana farms, 3 vegetable farms, and 2 former landfills, sediments from 13 rivers and fish from three rivers. The supplemental survey indicated only three farm and closed landfill soil sample showed detectable concentrations of DDE/dieldrin, but with concentrations less than the Canadian guidelines for freshwater sediments.

The Action Plan was set up in the format of an Environmental Management System, with identification of a primary concern/issue (Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes, as adopted by the NCC in January 2006), an overall Goal (Environmentally-Sound Management of (Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes, as adopted by the NCC in January 2006) and subsequently, through a series of Stakeholder meetings and NCC meetings, a series of Objectives, Targets, Performance Indicators and Milestones was developed and agreed. This format provides the Action Plan with a group of activities to be accomplished within a set timetable and framework.

The Action Plan is divided into the following elements:

- Section 3.2 discusses the elements of the supporting Policy Statement: Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes. It should be noted that the scope of the Policy Statement and supporting legislation and regulations have been extended from addressing only Persistent Organic Pollutants to also addressing other pesticides, related chemical substances, hazardous materials and hazardous wastes.

- Section 3.3 discusses the elements of a Framework, within which the Action Plans will be implemented.

- Section 3.4 discusses various sub-elements of the Action Plan.

- Section 3.5 discusses elements comprising development and capacity-building priorities for the Persistent Organic Pollutants and for other pesticides and hazardous materials and hazardous wastes.

- Section 3.6 uses the Environmental Management System format of Objectives, Targets, Performance Indicators and Milestones to develop an Implementation Timetable over a three-year implementation horizon.

- Section 3.7 discusses resource requirements over the proposed three-year implementation horizon, including identification of baseline (i.e., existing expenditures of the Government and private business) and incremental costs (i.e., costs that will be incurred in the implementation of the Action Plans) and potential funding sources.

3.2 POLICY STATEMENT

Background

By becoming Party to several international Conventions regarding chemical substances, the

Commonwealth of Dominica has made a commitment to its citizens and the international community to establish appropriate policies, protocols, legislation and regulations to protect human health and the environment through environmentally sound management of Persistent Organic Pollutants and other hazardous materials and hazardous wastes, pesticides and related substances, various industrial chemical substances, ozone-depleting substances and chemical weapons. This policy statement, Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes, has been divided into 29 elements, as described in the following text.

Administration and Implementation of Action Plan elements

Policy Statement #1. To successfully implement the Action Programme of the NIP, the Commonwealth of Dominica will enact a bill regarding the management of Persistent Organic Pollutants and other hazardous materials and hazardous wastes, pesticides and related substances, various industrial chemical substances, ozone-depleting substances and chemical weapons. This new Act will incorporate the provisions of the existing *Pesticides Control Act of 1974*, the existing *Noxious and Dangerous Substances Act of 1982* and the proposed Pesticides and Toxic Substances Control bill. The new Act will also cross-reference to the *Solid Waste Management Act of 2001* and the *Marine Pollution Management Act of 2002*.

Policy Statement #2. Under the new Act, the Commonwealth of Dominica will issue appropriate regulations, assign enforcement responsibilities and provide for a system of enforcement and punishment for failure to comply with published regulations. These regulations will be reviewed on an annual basis to ensure their measures reflect the current state of knowledge and components of the five key Conventions.

Policy Statement #3. As part of the administrative system for the new Act, the Commonwealth of Dominica will merge the duties and responsibilities of the current Pesticides Control Board into a new Hazardous Materials and Hazardous Wastes Management Board. The membership of this new Board will be enhanced to reflect a broader set of management issues and responsibilities. The Commonwealth of Dominica will appoint a Registrar/Executive Director to conduct the business of the Board and who will also chair the Technical Review committee. The Commonwealth will also appoint a National Hazardous Materials Advisory Board, which will meet at least twice per year to advise and provide comment to the Control Board and the Minister on issue of Persistent Organic Pollutants and other hazardous materials and hazardous wastes.

Policy Statement #4. The Commonwealth of Dominica will undertake various administrative changes to provide for the re-assignment of three Agriculture Extension Officers as Pesticide Control Officers, two Ministry of Trade staff as Hazardous Materials Control Officers and inspectors of the Labour Department and Environmental Health Department as Occupational Health and Safety Officers.

Persistent Organic Pollutants

Policy Statement #5. The Commonwealth of Dominica will ban the import, manufacturing, sale, use and/or distribution of eight Persistent Organic Pollutants, commonly known as: endrin, toxaphene, aldrin, dieldrin, heptachlor, chlordane, hexachlorobenzene and mirex. The Hazardous Materials and Hazardous Wastes Management Board will be authorized to issue special permits for the import of small quantities (as specified in the Convention) of these substances to be used in testing or research and development. To assist importers and

Customs Department, a list of trade names for these pesticides will be maintained by the Ministry of Trade, with assistance from the Environmental Coordinating Unit of the Ministry of Agriculture, Fisheries and Environment, so as to ensure none of these eight pesticides enter Dominica.

Policy Statement #6. The Commonwealth of Dominica will ban the import, manufacturing, sale and/or distribution of polychlorinated biphenyls or any equipment or products containing such chemical compounds, where the definition of "equipment or products containing polychlorinated biphenyls" has a concentration of more than 50 mg/Kg. The Hazardous Materials and Hazardous Wastes Management Board will be authorized to issue special permits for the import of small quantities (as specified in the Convention) of these substances to be used in testing or research and development.

The Commonwealth of Dominica recognizes that some electrical and other equipment may currently be in service in Dominica and contain polychlorinated biphenyls at a concentration of more than 50 mg/Kg. The Commonwealth of Dominica directs the owners of such equipment or products to remove these from active service by a specified date, with the exception of fluorescent light ballasts containing polychlorinated biphenyls. The Commonwealth of Dominica directs the owners of fluorescent light fixtures to assess the fixture ballasts and remove from service by a specified date, any fixture ballasts defined as containing polychlorinated biphenyls. By a specified date, all equipment and products containing polychlorinated biphenyls at concentrations greater than 50 mg/Kg will be removed from service and properly disposed.

Policy Statement #7. The Commonwealth of Dominica will ban the import, manufacturing, sale, use and/or distribution of any polychlorinated dibenzo furans and any polychlorinated dibenzo dioxins. The Hazardous Materials and Hazardous Wastes Management Board will be authorized to issue special permits for the import of small quantities of these substances to be used in testing or research and development. To reduce and phase out the unintentional generation and release of any polychlorinated dibenzo furans and any polychlorinated dibenzo dioxins that now occurs through barrel or backyard burning in rural areas, the Commonwealth of Dominica will prohibit the burning or combustion at temperatures of less than 1000 ^{o}C of any plastic materials, polychlorinated biphenyls, any organochlorine pesticide, equipment or products containing polychlorinated biphenyls at concentrations greater than 10 mg/Kg or any container formerly used to contain polychlorinated biphenyls or any organochlorine pesticide. Such plastic materials and containers and such chemical substances shall be brought to the facilities of the Dominica Solid Waste Management Corp. for proper handling and disposal. While no specific survey of the scope of such backyard burning has been undertaken, the issue was identified at all of the Stakeholder meetings.

Policy Statement #8. The Commonwealth of Dominica will impose special regulatory licensing requirements for the import, manufacturing, sale, use and/or distribution of the pesticide commonly known as DDT (dichlorodiphenyltrichloroethane) or any product containing more than 0.1% DDT. The Commonwealth of Dominica acknowledges that DDT is useful in controlling malarial mosquitoes, but it also recognizes that DDT is a Persistent Organic Pollutant and should be subject to strict licensing and controls for its import and use. In the event of a malarial mosquito outbreak, other pesticides will first be used and DDT will be permitted to be used under Ministry of Health direction only as a last resort. Each use will be subject to a separate application for permit to use. As Party to the Stockholm Convention, Dominica will register the special permit system with the Convention secretariat.

Policy Statement #9. The Commonwealth of Dominica will promote, through research and development and information/awareness campaigns, alternative products to the Persistent Organic Pollutant pesticides. These programs will also include provision of training to Agriculture Extension Officers, staff of the Dominica Banana Growers Association and other farm associations.

Policy Statement #10. As a Party to the Stockholm Convention, the Commonwealth of Dominica acknowledges the underlying principle of the Convention is to establish a system for the environmentally-sound management of other chemical substances that may be established through international agreement as unacceptable Persistent Organic Pollutants. The Commonwealth of Dominica will implement a process of annual review, implemented by MoAFE through the relevant department, of the activities and recommendations of the Stockholm Convention and implement appropriate policies and regulations and/or amendments to existing legislation to ensure the underlying principles of the Convention will continue to be met.

Other Pesticides and Related Chemical Substances

Policy Statement #11. The Commonwealth of Dominica will ban the import, manufacturing, sale, use and/or distribution of 31 chemical substances (pesticides and industrial chemicals) listed as Annex III of the Rotterdam Convention and not currently listed in Annexes of the Stockholm Convention: 1,2-dibromomethane (EDB), ethylene dichloride, fluoroacetamide, HCH, lindane, mercury compounds, monocrotophos, parathion, pentachlorophenol, methamidophos, phosphamidon, methyl parathion, polybrominated biphenyls (PBB), polychlorinated terphenyls (PCT), tetraethyl lead, tetramethyl lead, Tris, and dustable powders containing >7% benomyl or >10% of carbofuran or >15% thiram. The Hazardous Materials and Hazardous Wastes Management Board will be authorized to issue special permits for the import of small quantities of these substances to be used in testing or research and development. To assist importers and the Customs Department, a listing of all available trade names for these pesticides will be maintained by the Ministry of Trade, with assistance from the Environmental Coordinating Unit of the MoAFE, so as to ensure none of these compounds enters Dominica.

Policy Statement #12. The Commonwealth of Dominica will promote, through research and development and information/awareness campaigns, alternative products to the pesticides, both those listed in the Rotterdam Convention and other pesticides currently registered for use in Dominica. These programmes will also include provision of training to Agriculture Extension Officers, staff of the Dominica Banana Growers Association and other farm associations.

Policy Statement #13 The Commonwealth of Dominica will ban the import, manufacturing, sale and/or distribution of products containing more than 1% by weight of asbestos in the mineral forms of Crocidolite, Actinolite, Anthophyllite, Amosite and Tremolite. The Hazardous Materials and Hazardous Wastes Management Board will be authorized to issue special permits for the import of small quantities of these substances to be used in testing or research and development.

The Commonwealth of Dominica recognizes that some special products may include more than 1% of asbestos by weight and specific exemption permits may be granted for the importation and use of such products in Dominica. However, each import activity is subject to a new exemption permit request to ensure such activities are minimized.

The Commonwealth of Dominica will establish regulations under the proposed *Hazardous Materials and Hazardous Wastes Management Act* to control the current use, removal, handling

and disposal of asbestos-containing materials, as part of a broader effort to provide environmentally-sound management of hazardous materials.

Policy Statement #14. The Commonwealth of Dominica recognizes ethylene oxide may be used as a medical sterilizing substance. The import, sale, distribution and use of ethylene oxide will be permitted under a special exemption permit system. The proposed importer/user must show capability and capacity (e.g., certification of staff and facility by an internationally recognized health engineering association or certification body) to safely handle such a substance and show they have an appropriate and operating monitoring system to ensure proper occupational health and safety of all workers during use of the product.

Policy Statement #15. As a Party to the Rotterdam Convention, the Commonwealth of Dominica acknowledges the underlying principle of the Convention is to establish a system for the environmentally-sound management of the transport of chemical substances from other countries to Dominica. The Convention and its associated documents may be altered or enhanced from time to time, as may be established through international agreement. The MoAFE will implement a process of annual review, through the relevant department of the activities and recommendations of the Rotterdam Convention and implement appropriate policies and regulations and/or amendments to existing legislation to ensure the underlying principles of the Convention will continue to be met.

Other Hazardous Materials and Wastes

Policy Statement #16. The Commonwealth of Dominica will adopt the United Nations Global Harmonized System to identify and define all hazardous materials, hazardous wastes and other chemical substances. If a material is not currently defined by the Global Harmonized System, the International Maritime Dangerous Goods Code will be used as the source of identification information and labelling.

Policy Statement #17. As a Party to the Basel Convention, the Commonwealth of Dominica recognizes the long-term solution to the need for disposal of hazardous wastes is a reduction in the generation of such wastes - both in terms of quantity and hazard risk. The Commonwealth of Dominica will initiate actions to actively promote the use of cleaner production technologies and methods, thereby:

- Enhancing the reduction of the movement of hazardous and other wastes;
- Preventing and monitoring illegal traffic in hazardous wastes;
- Improving institutional and technical capabilities;
- Participating in regional and sub-regional opportunities for training and technology transfers.

Policy Statement #18. The Commonwealth of Dominica will promote and develop an environmentally sound management process for hazardous materials and hazardous wastes through a programme of legislation, regulations and enforcement. Further, the Commonwealth of Dominica will promote the concept of integrated life-cycle approach through careful management of the generation, storage, transport, treatment, reuse, recycling and disposal of all hazardous materials and wastes.

Policy Statement #19. The Commonwealth of Dominica will establish appropriate legislation and regulations to ensure adequate enforcement of the terms of the Basel Convention, in particular those sections dealing with documentation of the transboundary movement of all hazardous materials and wastes and the transboundary movement of hazardous wastes for the

purposes of disposal. This activity will also include ensuring the country receiving the hazardous materials and/or hazardous wastes has been adequately informed in advance of any shipment and has provided documented agreement to receive and treat/dispose of such wastes.

Policy Statement #20. As a Party to the Basel Convention, the Commonwealth of Dominica acknowledges the underlying principle of the Convention is to establish a system for the environmentally-sound management and minimization of the generation and transport of hazardous wastes from other countries to Dominica and from Dominica to other countries. The various procedures and protocols described in the Convention and its associated documents may be altered or enhanced from time to time, as may be established through international agreement. MoAFE will implement a process of annual review of the activities and recommendations of the Basel Convention, through the relevant department and implement appropriate policies and regulations and/or amendments to existing legislation to ensure the underlying principles of the Convention will continue to be met.

Policy Statement #21. The Commonwealth of Dominica will impose a levy on all pesticides on the basis of a charge per individual container. This levy will be maintained in a separate trust fund by the Dominica Solid Waste Management Corporation and 50% of the levy will be given to the person returning any pesticide container.

Ozone-Depleting Substances

Policy Statement #22. The Commonwealth of Dominica will phase out by 2010 the importation, and/or consumption of chlorofluorocarbons (commonly known as CFC's) and halons (see Table 3.2-1) whether as individual compounds, mixed compounds, equipment containing these compounds or mixtures of compounds or as substances used in the manufacture of flexible or rigid insulation foam or as substances used in the manufacture of plastic packaging. A specific set of regulations, "Ozone Layer Depletion Substances (Control) Regulations 2005" has been drafted and submitted for Cabinet's approval. The Regulation has been designed to reduce and eliminate national consumption and usage. The relevant authority as indicated within the regulation will be responsible for the issuance of special permits for the import of small quantities of these substances to be used in testing or research and development.

The Commonwealth of Dominica recognizes that specialized equipment may contain these substances and on application by an owner, may issue a special exemption permit to the owner/importer provided that person or party shows evidence of being able to operate and maintain such equipment without loss or accidental release of the compounds or mixtures of compounds.

Table 3.2-1: List of 25 Chlorofluorocarbon Compounds	
CFC-11	Trichlorofluoromethane
CFC-12	Dichlorodifluoromethane
CFC-13	Chlorotrifluoromethane
CFC-111	Pentachlorofluoroethane
CFC-112	Tetrachlorofluoroethane
CFC-113	1,1,2-trichloro-1,2,2-trifluoroethane
CFC-114	1,2-dichloro-1,1,2,2-tetrafluoroethane
CFC-115	1-chloro-1,1,2,2,2-pentafluoroethane

CFC-211	Heptachlorofluoropropane
CFC-212	Hexachlorodifluoropropane
CFC-213	Pentachlorotrifluoropropane
CFC-214	Tetrachlorotetrafluroropropane
CFC-215	Trichloropentrafluoropropane
CFC-216	Dichlorohexafluoropropane
CFC-217	Chloroheptafluoropropane
CFC-500	(CFC-1/HFC-132a)
CFC-501	(CFC-12/HCFC-22)
CFC-502	(HCFC-22/CFC-115)
CFC-503	(CFC-13/HCFC-23)
CFC-504	(CFC-12/HCFC-31)
CFC-505	(CFC-12/HCFC-31)
CFC-506	(HCFC-31/CFC-114)
Halon-1211	Bromodichlorodifluoromethane
Halon-1301	Bromotrifluoromethane
Halon-2402	Dibromotetrafluoroethane

Policy Statement #23. The Commonwealth of Dominica will institute a programme known as the "Terminal Phase Out Management Plan" funded by UNEP/UNDP for the safe removal from all equipment or fire-suppressant equipment, the 25 chlorofluorocarbons with complete removal by a specified date (2009). The Commonwealth of Dominica recognizes that some systems will continue to require the use of fire-suppressant equipment containing one or more of the chlorofluorocarbons and will provide a special exemption permit, on application, for each set of fire-suppressant systems. The responsible authority as indicated in the draft regulations will administer the ozone depleting substances management system.

Policy Statement #24. The Commonwealth of Dominica has instituted a system for the training of refrigeration technicians to ensure proper management of refrigeration and air-conditioning systems containing ozone depleting substances and the proper handling and removal of ozone depleting substances from such systems. The responsible authority as indicated in the draft regulations will maintain a list of such certified technicians and ensure such people are re-certified on a regular basis. The new Act will require that only certified technicians can conduct work on refrigeration or air-conditioning systems containing ozone depleting substances.

Policy Statement #25. As a Party to the Vienna Convention and the Montreal Protocol, the Commonwealth of Dominica acknowledges the underlying principle of the Convention and the Protocol is to establish a system for the environmentally-sound management of ozone-depleting substances. The Convention, the Protocol and the associated documents may be altered or enhanced from time to time, as may be established through international agreement. The Commonwealth of Dominica will implement a process, through the relevant department of the MoAFE, an annual review of the activities and recommendations of the Vienna Convention and Montreal Protocol and implement appropriate policies and regulations and/or amendments to existing legislation to ensure the underlying principles of the Convention and the Protocol will continue to be met.

Chemical Weapons

Policy Statement #26. The Commonwealth of Dominica will ban the import, manufacturing, acquisition, sale, use and/or distribution of pieces of equipment containing or the individual

chemical substances listed under the Chemical Weapons Convention, "Annex on Chemicals, Part A and Part B". The Hazardous Materials and Hazardous Wastes Management Board will be authorized to issue special permits for the import of small quantities (as specified in the Convention) of these substances to be used in testing or research and development.

Policy Statement #27. As a Party to the Chemical Weapons Convention, the Commonwealth of Dominica acknowledges the underlying principle of the Convention to establish a system for rigorous control of the chemicals which could be used in the production of chemical weapons. The Convention and associated documents may be altered or enhanced from time to time, as may be established through international agreement.

Workplace Health and Safety

The Commonwealth of Dominica treasures the good health of its citizens, of all ages. By implementing the various aspects of the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and other Hazardous Materials and Hazardous Wastes, the long-term goal will be an improvement in the health and well-being of the citizens of Dominica and their surrounding environment.

Policy Statement #28. The Commonwealth of Dominica will require all places of employment, government and private, to implement a Workplace Hazardous Materials Information System (WHMIS). This system will include a requirement for the immediate access of Material Safety Data Sheets (MSDS) for all hazardous materials and/or wastes in use in the particular place of employment, as well as other appropriate literature. Under this system, all workers and employers will be required to take appropriate training and awareness courses. Associated with the implementation of this system will be an enhancement of responsibilities of inspectors with the Labour and Environmental Health Departments to improve worker occupational health and safety.

Policy Statement #29. The Commonwealth of Dominica will adopt as occupational health exposure limits, the threshold limit values, time-weighted average values and the short-term exposure limit values, as specified in the most current guidelines published by the American Conference of Governmental Industrial Hygienists (ACGIH). All places of employment will be required to maintain working conditions or provide personal protective equipment to ensure the occupational health of all workers is adequately protected to meet the values specified in the ACGIH Threshold Limit Guidelines.

Policy Statement #30. The Commonwealth of Dominica will implement a system of public awareness campaigns and worker training to improve the overall understanding of occupational health and safety and the adoption of good work practices.

Fuels and Fuelling Facilities

Policy Statement #31. The Commonwealth of Dominica will require all facilities selling fuels of any type (LPG, gasoline, diesel, kerosene) to be registered to sell such products. The registration will include meeting requirements for dispensing of product in a safe manner, meeting inspections for correct dispensing of product by specified volume and having a capacity to respond to accidental spills and fires. All above ground and underground fuel storage tanks must be registered and inspected every three years to ensure no accidental loss of product is occurring. The amount of fuel in any underground fuel storage tank will be determined daily and log books maintained to ensure no fuel loss is occurring.

Policy Statement #32. The Commonwealth of Dominica will adopt a system for the collection of waste motor oils and similar products. The system will be financed through a levy imposed on each container or litre of new motor oil sold. The Dominica Solid Waste Management Corporation will maintain a system of suitable waste oil collection containers at fuel sales and vehicle repair facilities and arrange for product collection on a regular basis. The Commonwealth of Dominica will establish a system with suitable facilities to take the collected oil and re-cycle. Part of the product levy will be used to cover incurred costs; part of the levy will be used as a "reward" for the return of used oil containers.

3.3 IMPLEMENTATION STRATEGY

To implement the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes the Commonwealth of Dominica has developed an implementation strategy based on achieving an accepted set of goals, targets, timelines and environmental performance indicators.

The Implementation Strategy consists of seven steps as illustrated in Figure 3.3-1 and described in the following text.

Step 1. Basic Commitment.

By becoming Party to several international Conventions related to the management of chemical substances, the Commonwealth of Dominica has made a commitment to its citizens and the international community to establish appropriate policies, protocols, legislation and regulations to protect human health and the environment through environmentally sound management of hazardous materials and hazardous wastes, including persistent organic pollutants, pesticides and related substances, various industrial chemical substances, ozone-depleting substances and chemical weapons.

Step 1 has been completed, with the exception of passage and proclamation of appropriate national legislation and regulations (Step 3 activities).

Step 2. Development of and adoption of Policy.

Through a series of consultative meetings with a broad spectrum of stakeholders, the Commonwealth of Dominica has developed and will adopt a Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes. This Policy Statement will address Persistent Organic Pollutants, other pesticides and related substances, various industrial chemical substances, ozone-depleting substances and chemical weapons.

This Policy Statement has been reviewed and accepted by the National Coordinating Committee for the Persistent Organic Pollutants Enabling Activity. The Policy Statement has been submitted to the Government of Dominica for review and acceptance.

Step 3. Passage and Proclamation of Legislation and Regulations

Using the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes, the Commonwealth of Dominica will complete, will pass and will officially proclaim into law, The *Hazardous Materials and Hazardous*

Wastes Management Act. This *Act* will be enacted and proclaimed by a specified date. Appropriate regulations will be developed, reviewed through a process of public consultation and officially published by a specified date. The new Act will incorporate the existing *Pesticides Control Act of 1974*, the existing *Noxious and Dangerous Substances Act of 1982* and the proposed Pesticides and Toxic Substances Control bill of 2004. The new Act will also link to and cross-reference with the *Solid Waste Management Act of 2001* and the *Marine Pollution Management Act of 2002*.

The new Act is proposed to include:

- Provision of regulations controlling the import, use, storage, handling and disposal of all types of pesticides, including those intended for agricultural, forestry, construction-related and household uses. The proposed Act will have six lists of regulated substances: List 1 will include the 9 Group I Persistent Organic Pollutant pesticides and ban the import, sale, use and/or distribution of these compounds; List 2 will include 31 other chemical substances listed in the Rotterdam Convention (not forming part of the Group 1 Persistent Organic Pollutants list of substances) and will ban the import, sale, use and/or distribution of these compounds; List 3 will include all other pesticides now registered for use in Dominica, so as to provide a basis for their proper management and regulation of their import, sale, use and/or distribution. Any substance on List 3 will be subject to re-registration every three years. List 4 will include all other pesticides and hazardous materials not currently registered for import, sale, distribution and/or use in Dominica. List 5 will include all substances forming List A of the Chemical Weapons Convention. List 6 will include all substances forming List B of the Chemical Weapons Convention.
- Provision of the placement of other pesticides on Lists 1 or 2 as the Stockholm or Rotterdam Conventions are modified.
- Provision of the placement of substances from List 4 to List 3, after the substances have undergone a suitable technical review by the Hazardous Materials and Hazardous Wastes Management Board.
- Provision of a permit system to allow for the entry of small quantities of substances for the purposes of testing and/or research and development.
- Provision of regulations regarding other hazardous materials and wastes; their import, use, storage, handling and disposal.
- Provision of regulations regarding the management of contaminated sites; how to define a contaminated site, how such a site is assessed, how such a site should be managed, how it should be remediated and how to define a “cleaned” site.
- Provision of regulations regarding the identification of hazardous materials and wastes, during handling, packaging, transport and storage, using the United Nations Global Harmonized System.
- Provision of regulations to protect workers handling, using, storing or disposal of pesticides. The purpose would be not to burden the farmer with unnecessary regulation, but to ensure their health and the health of their families and workers is reasonably protected.
- Provision of regulations to protect workers handling all types of hazardous materials and wastes, including the provision of a Workplace Hazardous Materials Information System (Material Safety Data Sheets). These regulations would include personal protective equipment, provision of warning labels, signs and emergency response information.

- Incorporating the existing Pesticides Control Board into a new Hazardous Materials and Hazardous Wastes Management Board, with provision of a Registrar/Executive Director.
- National implementation of the Stockholm Convention on Persistent Organic Pollutants.
- National implementation of the Rotterdam Convention on Prior Informed Consent (note: national implementation of the Basel Convention and MARPOL 73/78 were accomplished through the Marine Pollution Management Act of 2002).
- National implementation of the Vienna Convention on Ozone Depleting Substances and the associated Montreal Protocol.
- National implementation of the Chemical Weapons Convention.

As part of the Policy Statement, the Commonwealth of Dominica is committed to an annual review of changes to its obligations under any one of the five Conventions. The results of this review, after consultations with Stakeholders, may result in amendments to the *Hazardous Materials and Hazardous Wastes Management Act* and/or regulations issued under this *Act*.

Step 4. Enhancement of Administrative and Institutional Capacity

With proclamation of the *Hazardous Materials and Hazardous Wastes Act*, the Commonwealth of Dominica will implement the following administrative changes to facilitate enhanced management of such materials and wastes.

- **Hazardous Materials and Wastes Management Board.** The existing Pesticides Control Board is proposed to re-profiled into a new Hazardous Materials and Hazardous Wastes Management Board, with provision of a Registrar/Executive Director. This person will have appropriate technical qualifications to assist the Board in their deliberations, will conduct the general business of the Board and will act as chair of the Technical Advisory Committee. As the Board will be managing a broader set of hazardous materials than just pesticides, its membership will be broadened to include appropriate other ministries, such as Trade. In accordance with the relevant Act, funding will be provided to cover salary and expense costs and cover the cost of provision of outsider expertise, on an as-needed basis.

- **Pesticides Regulation**. Three Agriculture Extension Officers will be appointed as Pesticides Control Officers, with broader powers of enforcement with respect to licensing facilities to sell pesticides, as well as the use, storage, handling and disposal of pesticides. The requirements for improved regulations will be addressed by the proposed new Act.

- **Hazardous Materials Regulation**. Two staff will be appointed within the Dominica Bureau of Standards (Ministry of Trade), with duties to address the labelling, handling, transport, and storage of all hazardous materials and wastes. The primary role of the Hazardous Materials Control Officers will be to assess handling and transport, to ensure all such activities meet the United Nations Global Harmonized System (UNGHS) and the International Maritime Dangerous Goods (IMDG) Code systems of material identification, labelling, placarding and provision of Material Safety Data Sheets. The Hazardous Materials Control Officer(s) would also be responsible for inspection of facilities that handle, store and sell non-pesticide hazardous materials to ensure compliance with the Workplace Hazardous Materials Information System and provision of information to workers.

- **Hazardous Wastes Reception and Disposal.** One person within the Dominica Solid Waste Management Corporation will be designated as responsible for reception and disposal of hazardous wastes, of all types. This will include waste pesticide containers, waste banana blue bags, biomedical wastes, assessment of refrigerant systems before disposal to ensure proper removal of CFC's (ozone depleting substances), hazardous and contaminated waste construction and demolition materials, contaminated soils and miscellaneous containers and materials. The regulatory requirements will be addressed under the proposed new Act. The new staff member would also be responsible for assessing hazardous materials disposal within the normal solid wastes delivered to the Fond Cole Solid Waste Facility, provision and delivery of public information and awareness campaigns and organization of collection days specifically designed to encourage proper household and farm hazardous wastes and containers disposal (e.g., Household Hazardous Waste Day).

- **Occupational Health.** The current Labour Department inspectors and inspectors or control officials of other Departments will be given additional powers of inspection and regulation will be given to facilitate full compliance with the proposed provisions of the Workplace Hazardous Materials Information System.

- **Activities of the MoAFE through the Relevant Department.** One person within the relevant department of the MoAFE will be given specific roles to facilitate (1) provision of strategic overview on the issue of hazardous materials and wastes; (2) coordination of various stakeholder interests through chairing of annual meetings; and, (3) ensuring Dominica continues to meet its signatory obligations under the Stockholm Convention on Persistent Organic Pollutants, the Rotterdam Convention on Prior Informed Consent, the Basel Convention on the Control of the Trans-Boundary Movements of Hazardous Wastes and Their Disposal and the Vienna Convention on Ozone-Depleting Substances/Montreal Protocol.

The Commonwealth of Dominica will ensure these administrative and staffing changes are completed by a specified date.

Step 5. Management of Hazardous Materials and Hazardous Wastes.

To effectively manage the large number of actual or potential hazardous materials and hazardous wastes that currently are in Dominica, may enter Dominica or may be exported or shipped from Dominica, a multi-component management system will be instituted. The Commonwealth of Dominica is committed to having this management system in place by a specified date.

- **Hazardous Materials Registration and Permit System**. Currently, all pesticides are regulated under a three-year registration system. This system will be extended to require all materials classed under the United Nations Global Harmonized System as "hazardous" to require a registration number for import, sale, use, distribution or disposal within Dominica. This registration and permit system will be maintained by the new Hazardous Materials and Hazardous Wastes Management Board.

- **Implementation of Hazardous Materials and Wastes Tracking System.** To "track" all hazardous materials and wastes in Dominica, an appropriate "tracking system will be purchased and commissioned by the Ministry of Trade. This system will provide for

tracking of all hazardous materials from the time of entry at the Port, through transport/handling/storage to sale to the user and thence disposal of the waste container at the Solid Waste Management facility.

- **Implementation of a Workplace Hazardous Materials Information System (WHMIS).** To protect worker occupational health, an appropriate WHMIS system, including display or provision of Material Safety Data Sheets (MSDS), worker personal protective equipment and worker/employer training and awareness campaigns will be implemented. This component will be implemented by the Ministry of Trade/Labour Department.

- **Hazardous Wastes Facility.** The Dominica Solid Waste Management Corporation will construct a suitable facility for the handling, temporary storage or re-packaging of hazardous wastes of any kind, including pesticide containers or banana blue bags.

- **Extension of the existing Farm/Store/Hotel User Information Database.** The Dominica Persistent Organic Pollutants Enabling Activity Project financed the initial survey of 1178 farms, 117 stores and 58 hotels/guesthouses. The survey forms will be enhanced in response to stakeholders' comments and recommendations and the survey extended to include all farms, stores selling pesticides or hazardous materials and hotels. Also the survey will include other potential hazardous materials sites, such as gasoline service stations. These data will be input into the existing database provided on the ECU website.

- **Pesticide Residues Laboratory.** As part of the proposed National Centre for Excellence, the current Crop and Food Testing Laboratory will be expanded. The new Centre will include capacity to properly extract all forms of pesticides from soils, sediments, food stuffs, forest products and fish for the purposes of subsequent testing. However, due to the high capital and maintenance costs of having capacity for analytical determination of all pesticides, the Commonwealth of Dominica will enter into a standing two-year agreement with the Caribbean Environmental Health Institute to complete the required analyses of the extracted samples. This Agreement will be reviewed every two years to ensure the activities are meeting the needs of Dominica. If the Agreement does not meet the needs and expectations of Dominica, the Commonwealth of Dominica may elect to enhance the new Crop Laboratory to also provide for full testing of pesticide residues in food, soils, sediment and human tissue/blood.

- **Toxic Substances Referral Centre.** To minimize health concerns regarding accidental exposure or consumption of hazardous materials and hazardous wastes, the Commonwealth of Dominica will establish a Toxic Substances Referral Centre at the primary health centre in Roseau. This centre will be able to provide by 24/7 telephone or Internet contact, relevant information to medical and health services staff throughout Dominica. The Centre will also be available to provide information to first responders at accidents.

Step 6. Public Awareness and Training.

A key step in effective implementation of the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes is public education and awareness and user training. The Commonwealth of Dominica will institute appropriate programmes of awareness and training to be instituted by a specified date, with the training of the first cadre of private and government staff by a specified date.

- **Training #1.** All government staff members and staff of appropriate private companies will successfully complete appropriate training courses and workshops to ensure they meet the necessary requirements of knowledge, regarding environmentally-sound management of Persistent Organic Pollutants and other hazardous materials and hazardous wastes. Examples are: (1) Transport and Handling of Hazardous Materials Using the UN Global Harmonized System and the International Maritime Dangerous Goods Codes (2) Handling and Removal of Ozone Depleting Substances (3) Sale of Pesticides (4) Application of Pesticides. As appropriate, the Commonwealth of Dominica will solicit national, regional and international specialists to develop and deliver training programmes in Dominica. These programmes will serve to "train the trainers" and commit participants to assisting in training other staff within their respective institutions or companies. All such training programmes will provide "certified" participants, whose names will be retained in a registry by the Ministry of Trade so as to assist businesses needing such specialized trained personnel. The list will also serve to ensure trainees are re-certified on a regular basis (e.g., every two years).

- **Training #2.** Appropriate government departments will institute training programmes for the broader hazardous materials user community (e.g., Agriculture Extension Officers for farmers). In parallel, there will also be training programmes for importers, sellers and distributors. Examples of training courses are: (1) Pesticides and Material Safety Data Sheets; (2) Personal Protective Equipment during the application of pesticides; (3) Protecting the Environment during the Application of Pesticides.

- **Awareness Campaigns.** The Commonwealth of Dominica will commit to a broad programme, using media, schools, internet and other means to assist Dominicans in becoming fully aware as to the health and safety and environmental issues related to all Persistent Organic Pollutants and other hazardous materials and hazardous wastes and the regulations being instituted to better manage such materials.

- **Schools.** The Commonwealth of Dominica will develop special courses or extra courses to augment the current science curriculum and better introduce the environmentally-sound management of hazardous materials and pesticides.

Step 7. Monitoring.

As Party to the five Conventions, the Commonwealth of Dominica is obligated to provide annual reporting on relevant activities to the Secretariats of each of the Conventions. The Commonwealth of Dominica will establish a monitoring and reporting system that will consist of the following activities:

- **Annual Reviews.** Each year, the Hazardous Materials and Hazardous Wastes Management Board will conduct an annual review of changes or enhancements required in the policy, legislation, regulations or mode of implementation of the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes. The annual reviews will also serve to assist the Board in assembling and collating information that will be used to prepare Annual State of Hazardous Materials Reports to be submitted to Parliament and to the Secretariats of the Conventions. The Board will draw on information from the National Hazardous Materials and Wastes Tracking System and the Product Registration System.

- **Reduction of existing stockpiles.** Currently, there are two known stockpiles of old pesticides: warehouse in Stock Farm and buried within the former Roseau Landfill in Stock Farm. The stockpile in the warehouse will be collected and placed in a fire-safe and secure warehouse by the Ministry of Agriculture. Materials will then be shipped to an appropriate destruction/treatment facility or an appropriate technology will be temporarily located in Dominica to complete the material destruction. This activity will be completed by a specified date. Another part of this action will be the re-introduction of "Pesticide Week" and the introduction of semi-annual "Household Hazardous Waste Days", as part of the public campaign to reduce the quantities and stockpiles of pesticides.

- **Reduction and Removal of PCB**. DOMLEC, the local electrical utility, is currently conducting a programme to remove any old transformers that may contain PCB as the dielectric fluid. To-date, their testing has indicated that less than 2% of all transformers and capacitors are believed to contain PCB oils. All of these electrical units will be removed from service and properly disposed by a specified date. Concurrently, the Commonwealth of Dominica will begin a campaign to have all fluorescent light fixture ballasts examined and any that contain or are suspected to contain PCB will be replaced by "non-PCB" containing ballasts. This campaign will ensure full removal of all such ballasts by a specified date. All such ballasts will be collected by the Solid Waste Management Corp. and properly disposed.

Figure 3.3-1: Key Action Steps of National Implementation Plan

STEP 1	STEP 2	STEP 3
Basic Commitment	**Develop and Adopt Policy for the Environmentally-Sound Management of Hazardous Materials and Hazardous Wastes**	**Legislation and Regulations**
Party to: • ***Stockholm Convention*** • ***Rotterdam Convention*** • ***Basel Convention*** • ***Vienna Convention/ Montreal Protocol*** • ***Chemical Weapons Convention*** • ***MARPOL 73/78*** • ***Cartagena Convention***	Develop Policy Statement	Complete drafting of Hazardous Materials and Hazardous Wastes Act
	Conduct Stakeholder consultations	Act approved by Cabinet and submitted to Parliament
	Modify Statement based on Stakeholder Consultations	Parliament passes Act and Act is formally Proclaimed
	Formally adopt modified Policy	Stakeholder consultation on Regulations
		New Regulations are published

Figure 3.3-1 (Continued): Key Action Steps of National Implementation Plan

STEP 4	STEP 5	STEP 6	STEP 7
Administration and Institutional Capacity Enhancement	**Management of Hazardous Materials and Hazardous Wastes**	**Training and Public Awareness**	**Monitoring**
Adopt administrative changes for Hazardous Materials and Hazardous Materials Management Board, including existing Pesticides Control Board	Administrative changes to provide for Regulation of all Hazardous Materials, including re-registration of existing Pesticide Registrations	Establish training programmes for government and private industry staff	Establish annual reviews of need to respond to changes in five Conventions
Administrative changes for Pesticides Control Officers	Establish Hazardous Materials Tracking System	Establish training programmes for Hazardous Material users	Use database and tracking system to prepare Annual State of Hazardous Materials Report to Parliament and to Conventions
Administrative changes for new Hazard Material Control Officers	Establish Hazardous Material receiving facility at Solid Waste Facility	Conduct Public Awareness Campaigns	Conduct campaigns to reduce and remove any stockpiles of POPs and other hazardous materials

Figure 3.3-1 (Continued): Key Action Steps of National Implementation Plan

STEP 4	STEP 5	STEP 6	STEP 7
Administrative changes for staff at Dominica Solid Waste Management Corporation	Extend and complete existing Pesticides Use and Activities Database	Identify alternative products to pesticides and promote such alternatives	Remove and properly dispose of known stockpiles of pesticides
Administrative changes for Labour Department and Environmental Health Department Officers	Enhance capacity for Pesticide Residues analysis at Crop Laboratory	Conduct training programmes on use of pesticides and safe application of pesticides	Complete removal of all PCB containing equipment from service
Professional Staffing changes for Environmental Coordinating Unit Hazardous Material activity	Establish Toxic Substances Referral Centre		Complete removal of all PCB containing fluorescent light ballasts from service
	Establish WHMIS and implement full MSDS and Workplace Occupational Health & Safety Programme		

3.4 ACTIVITIES, STRATEGIES AND ACTION PLANS

Overview

On the recommendation of the National Coordinating Committee, a Goal of implementing environmentally-sound management of Persistent Organic Pollutants and other hazardous materials and wastes was adopted by the Government of Dominica. From that Goal, the, Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes was developed and adopted. Adoption of this Policy and implementation of the elements of the Action Plan will enable the Government of Dominica to provide a net improvement to the health of its citizens and the general environment of Dominica.

The purpose of the Action Plan is to provide the Government of Dominica and the relevant private sector with a framework and set of Objectives, Targets, Performance Indicators and Milestones, all to assist in the implementation through a staged approach over a three-year horizon. After this time, the management of hazardous materials and hazardous wastes will be fully integrated into government and private business activities and the "incremental" costs will not be continued.

Using the Objectives, Targets, Performance Indicators and Milestones, a budget has been developed for the project over a three year time frame for the implementation phase. Approximately 40% or US $762,000 is considered as "incremental" and 60% or US $1,144,000 is considered as "baseline" contribution by the Government of Dominica. Financing of the incremental factor will be sought from international agencies, primarily the Global Environment Facility through the United Nations Environment Programme and the Government of Canada.

Strategy Framework

The Strategy Framework has been divided into two parts to address (1) Persistent Organic Pollutants and (2) Other pesticides, hazardous materials and hazardous wastes. The Framework was developed during two major Stakeholder meetings in March 2006 at which information being collected and reviewed to develop the National Profile was presented and discussed and Actions to address several identified issues were reviewed and discussed. At the Stakeholder Meeting in April 2006, the issues were reviewed from a view of risk reduction and risk management to develop a priority of activities for the Action Plan.

Persistent Organic Pollutants

With respect to the Persistent Organic Pollutants, the Framework builds on existing processes and Acts through three key components:

(1) Implementation of the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes.

(2) Passage and implementation of the *Hazardous Materials and Hazardous Wastes Management Act* and associated regulations and which provides the national aspect of the accession to the Stockholm Convention on Persistent Organic Pollutants, the Rotterdam Convention on Prior Informed Consent, the Vienna Convention on Ozone Depleting Substances and the Chemical Weapons Convention. This Act incorporates the *Pesticides Control Act of 1974* and the proposed *Pesticides Control and Toxic Substances Act*.
(3) Extension of the activities of the existing Pesticides Control Board and Implementation of appropriate institutional improvements in the government and private sector, providing concrete actions to match the policy statements of the Policy and the Act.

The Framework on the government side will be implemented primarily by MoAFE (Hazardous Materials and Hazardous Wastes Management Board, Pesticide Control Officers and the Environmental Coordinating Unit), advised by the National Hazardous Materials and Wastes Advisory Committee. Secondarily, the Ministry of Trade, the Ministry of Health and the Dominica Solid Waste Management Corporation will also contribute to the successful implementation of elements of the Action National Plan.

In the private sector, relevant activities will be implemented by farmers, retail sales outlets, importers and wholesales facilities. The role of the private sector in successful implementation of the Action Plan has been discussed by the private sector through a series of Stakeholder meetings.

With respect to the pesticide DDT, the Government will set up and implement a specific Action Plan (see Section 3.4) to ensure proper management of the very restricted use of this substance. Also the Government will register with the Secretariat of the Stockholm Convention regarding the DDT Action Plan.

Other Pesticides and Hazardous Materials

With respect to Other Pesticides and Hazardous Materials, the Framework extends existing Acts and activities, as well as extending the proposed components addressing the Persistent Organic Pollutants, by means of three key components:

(1) Implementation of the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes. This Policy extends existing pesticide control measures to include all pesticides (of any formulation) and all hazardous materials (as defined by the United Nations Global Harmonized System for Materials.
(2) Passage and implementation of the *Hazardous Materials and Hazardous Wastes Management Act* and associated regulations and which provides the national aspect of being a Party to the Stockholm, Rotterdam, Vienna and Chemical Weapon Convention. This Act incorporates the *Pesticides Control Act of 1974* and the proposed *Pesticides Control and Toxic Substances Act,* as well as the *Noxious and Dangerous Substances Act of 1982.*

(3) Implementation of appropriate institutional improvements in the government and private sector providing concrete actions to match the policy statements of the Policy and the Act.

The Framework on the government side will be implemented primarily by MoAFE (Hazardous Materials and Hazardous Wastes Management Board, Pesticide Control Officers and the Environmental Coordinating Unit), all advised by the National Hazardous Materials and Wastes Advisory Committee. Secondarily, the Ministry of Trade, the Ministry of Health and the Dominica Solid Waste Management Corporation will also contribute to the successful implementation of the National Plan.

Relevant activities involving the private sector will be implemented by farmers, retail sales outlets, importers and wholesales facilities. These activities and the role of the private sector have been discussed with the private sector through a range of Stakeholder meetings.

Process of Review and Updating the National Implementation Plan

The Action Plan was set up in the format of an Environmental Management System, with identification of a primary concern/issue, an overall Goal and a series of Objectives, Targets, Performance Indicators and Milestones developed and agreed. The process of review and updating will continue in the Environmental Management System format, through the "Continuous Improvement Process" of (1) Policy development, (2) Planning, (3) Implementation, (4) Monitoring, and (5) Management review and modification of policies/activities.

To facilitate the review process, the format of the National Coordinating Committee, developed for the Persistent Organic Pollutant Enabling Project, will be altered to become the National Hazardous Materials and Wastes Advisory Committee. The new Committee would be tasked with a broader mandate – all pesticides and hazardous materials – and will provide an external advisory group to the Hazardous Materials and Hazardous Wastes Management Board and the Technical Steering Committee. By meeting twice per year, the enhanced Committee will provide an overview role and take a more strategic direction in its reviews. The resultant discussions and recommendations would then form part of the process of modification to the National Implementation Plan.

To further augment the review, the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes includes a requirement for an annual review of changes to the international Conventions to ensure the Implementation Plan and the Act are evaluated and, as appropriate, adjusted to reflect changes in the list of chemical substances identified in the Conventions.

The recommendations and findings will be used by the Hazardous Materials and Hazardous Wastes Management Board to prepare an Annual State of the Hazardous Materials and Waste Management to be provided to Parliament and, with their approval, to the Secretariats of the Conventions. The Hazardous Materials and Hazardous Wastes Management Board will develop appropriate recommendations to the Ministry of Legal Affairs to provide for changes to

regulations, enforcement protocols or other aspects of the Act.

Institutional and Regulatory Strengthening Measures

Currently, pesticides are regulated through measures and review procedures of the Pesticide Control Board, a Technical Steering Committee and one designated Pesticides Control Officer (an agriculture extension officer within the Ministry of Agriculture, Fisheries and the Environment).

One of the Action Plan elements will be the re-profiling of the existing Pesticide Control Board is proposed to re-profiled into a new Hazardous Materials and Hazardous Wastes Management Board, with provision of a Registrar/Executive Director. The Registrar/Executive Director will have appropriate technical qualifications to assist the Board in their deliberations, will conduct the general business of the Board and will act as the chair of the Technical Advisory Committee. As the Board will manage a broader set of materials, its membership will be broadened to include appropriate other ministries, such as Trade.

Two additional Agriculture Extension Officers will be designated as Pesticide Control Officers. All three officers will be given broader powers of enforcement with respect to licensing facilities to sell pesticides, as well as the use, storage, handling and disposal of pesticides.

In parallel to the Pesticide Control Officers, two staff within the Dominica Bureau of Standards (Ministry of Trade) will be designated as Hazardous Materials Control Officers, with duties to address the labelling, handling, transport, and storage of all hazardous materials and wastes. The primary role of the Hazardous Materials Control Officers will be to assess handling and transport, to ensure all such activities meet the United Nations Global Harmonized System (UNGHS) and the International Maritime Dangerous Goods (IMDG) Code systems of material identification, labelling, placarding and provision of Material Safety Data Sheets. The Hazardous Materials Control Officer(s) will work with Department of Labour inspectors with respect to the inspection of facilities that handle, store and sell non-pesticide hazardous materials to ensure compliance with the Workplace Hazardous Materials Information System and provision of information to workers.

Additional powers of inspection and regulation will also be given to Labour Department inspectors and Environmental Health officers to facilitate full compliance with the proposed provisions of the Workplace Hazardous Materials Information System.

One person within the Dominica Solid Waste Management Corporation will be designated as responsible for reception and disposal of hazardous wastes, of all types. This will include waste pesticide containers, waste banana blue bags, biomedical wastes, assessment of refrigerant systems before disposal to ensure proper removal of ozone depleting substances (CFC's), hazardous and contaminated waste construction and demolition materials, contaminated soils and miscellaneous containers and materials. The regulatory requirements will be addressed under the proposed new Act. The new staff member will also be responsible for assessing hazardous materials disposal within the normal solid wastes delivered to the Fond Cole Solid

Waste Facility, provision and delivery of public information and awareness campaigns and organization of collection days specifically designed to encourage proper household and farm hazardous wastes and containers disposal (e.g., Household Hazardous Waste Day).

One person within the Environmental Coordinating Unit of the Ministry of Agriculture, Fisheries and the Environment will be given specific roles to facilitate (1) provision of strategic overview on the issue of hazardous materials and wastes; (2) coordination of various stakeholder interests through chairing of annual meetings; and, (3) ensuring Dominica continues to meet its signatory obligations under the Stockholm Convention on Persistent Organic Pollutants, the Rotterdam Convention on Prior Informed Consent, the Basel Convention on the Control of the Trans-Boundary Movements of Hazardous Wastes and Their Disposal and the Vienna Convention on Ozone-Depleting Substances/Montreal Protocol.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will provide for a full set of supporting regulations, enforcement protocols, penalties (including provision of issuing of summary tickets, as well as Ministerial Orders) and other powers of the Control Officers.

Measures to Reduce or Eliminate Releases from Intentional Production and Use

Persistent Organic Pollutants

There are no facilities for the manufacture of any of the Persistent Organic Pollutants of any type on Dominica or use of any of the Pollutants to manufacture other products; all products are imported.

A questionnaire survey of 1178 farms, 117 retail outlets and 58 hotels/guesthouses from locations throughout Dominica and representing all types of facilities was conducted in January-February 2006. The results of the survey indicated one farm had a bottle (0.5L) of mirex and two hotels had bottles (0.25L each) of aldrin; there was no use of, or stockpiles of products or stockpiles of wastes of the other eight Persistent Organic Pollutants pesticides. Most farmers have remained current as to the most effective pesticide and now predominately use various organophosphate and organochlorine herbicides (glyphosate, paraquat) and carbamate pesticides, such as sevin.

The Ministry of Agriculture, Fisheries and the Environment will actively research and identify pesticide alternatives. They will work with the Dominica Organic Agricultural Movement Inc. (DOAM), the Dominica Banana Growers Association, the Dominica Fair Trade Organization and the Windward Islands Farmers Association group to provide demonstrations to farmers and further encourage non-chemical pest control.

An element of the Action Plan will provide for installation of a computerized tracking system of all pesticides and other hazardous materials. The system will be initiated at the point of import and then track the product through the life cycle of transport, storage, sales, use and container disposal. In this way, all hazardous materials will be tracked from entry to disposal.

As part of the overall strategy for the better management of pesticides and hazardous materials, activities, such as aerial spraying (airplane and/or helicopter), uncontrolled product use and spraying and "overuse" of pesticides will be curtailed and/or banned.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will provide a timetable for the cessation of the use of polychlorinated biphenyls in any form of electrical equipment and proper disposal of such materials, including fluorescent light ballasts. This is in response to a surveyed amount of less than 2% of the 715 transformers at DOMLEC are suspected to contain PCB. Each transformer is only tested when removed from service. No survey has been taken of fluorescent light ballasts, other than to note that many fluorescent fixtures are older than 25 years and therefore have a high potential for containing PCB. Part of the Action Plan will include provision of a programme for ballast assessment and replacement.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will ban all such open-air burning and thereby limit the accidental formation of polychlorinated dibenzo furans and polychlorinated dibenzo dioxins. While there has been no definitive survey of this issue, concerns regarding such burning have been raised at several of the Stakeholder meetings.

Other Pesticides and Hazardous Materials

There are no facilities for the manufacture of pesticides of any type or use of any of the compounds to manufacture other products on Dominica; all products are imported.

Surveys of 1178 farms and 117 retail outlets, conducted in January-February 2006 indicated there was extensive use of other pesticides, particularly glyphosate, an organophosphorus herbicide, various fungicides (non-organochlorine) specific to the banana industry and various insecticides (non-organochlorine) specific to the banana industry. Several of these products were also noted at vegetable and fruit farms, particularly glyphosate and sevin (carbamate insecticide). A survey in April 2006, indicated several retail outlets carried large amounts of pesticides (mostly non-organochlorine); e.g., one retail outlet had 25 cases (500 mL x 12) bottles of Roundup (glyphosate) in their storeroom and 2 opened cases on their display shelves.

The Ministry of Agriculture, Fisheries and the Environment will actively research and identify pesticide alternatives. They will work with the Dominica Organic Agricultural Movement Inc. (DOAM), the Dominica Banana Growers Association, the Dominica Fair Trade Organization and the Windward Islands Farmers Association group to provide demonstrations to farmers and further encourage non-chemical pest control.

The proposed Action Plan will provide for a computerized tracking system. The system will be initiated at the point of import and then track the product through the life cycle of transport, storage, sales, use and container disposal. In this way, all hazardous materials will be tracked from entry to disposal.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will impose stricter controls on the storage and display of all pesticides and hazardous materials, as well as

the provision of a Workplace Hazardous Materials Information System display areas and appropriate Material Safety Data Sheets, and other relevant information on personal protective equipment.

Production, Import/Export, Use, Stockpiles and Wastes

Persistent Organic Pollutants

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will impose a ban on the import, manufacturing, sale, use, distribution or export for sale of eight Persistent Organic Pollutants, commonly known as: endrin, toxaphene, aldrin, dieldrin, heptachlor, chlordane, hexachlorobenzene and mirex. To assist importers and the Customs Department, a listing of all available trade names for these pesticides will be maintained by the Ministry of Trade, with assistance from MoAFE through relevant department, so as to ensure none of these eight pesticides is introduced or otherwise enters Dominica.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will impose a ban on the import, manufacturing, sale and/or distribution of polychlorinated biphenyls or any equipment or products containing such chemical compounds, where the definition of "equipment or products containing polychlorinated biphenyls" is having a concentration of more than 50 mg/Kg.

It is recognized that some electrical and other equipment may currently be in service in Dominica and contain polychlorinated biphenyls at a concentration of more than 50 mg/Kg. The Commonwealth of Dominica directs the owners of such equipment or products to remove these from active service by a specified date, with the exception of fluorescent light ballasts containing polychlorinated biphenyls. By a specified date, the owners of fluorescent light fixtures will have to assess the fixture ballasts and remove from service any ballasts defined as containing polychlorinated biphenyls. By a specified date, all equipment and products containing polychlorinated biphenyls will be removed from service and properly disposed. This is in response to a surveyed amount of less than 2% of the 715 transformers at DOMLEC that are suspected to contain PCB. Each transformer is only tested when removed from service. No survey has been taken of fluorescent light ballasts, other than to note that many fluorescent fixtures are older than 25 years and therefore have a high potential for containing PCB. Part of the Action Plan will include provision of a programme for ballast assessment and replacement.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will impose a ban on the import, manufacturing, sale, use and/or distribution of any polychlorinated dibenzo furans and any polychlorinated dibenzo dioxins. To limit the accidental generation and release of any polychlorinated dibenzo furans and any polychlorinated dibenzo dioxins, the proposed *Hazardous Materials and Hazardous Wastes Management Act* will prohibit the burning or combustion at temperatures of less than 1000 ^{o}C of any plastic materials, polychlorinated biphenyls, any organochlorine pesticide, equipment or products containing polychlorinated biphenyls at concentrations greater than 10 mg/Kg or any container formerly used to contain polychlorinated biphenyls or any organochlorine pesticide. Such plastic materials and

containers and such chemical substances shall be brought to the facilities of the Dominica Solid Waste Management Corporation for proper handling and disposal. The proposed *Hazardous Materials and Hazardous Wastes Management Act* will ban all such open-air burning and thereby limit the accidental formation of polychlorinated dibenzo furans and polychlorinated dibenzo dioxins. While there has been no definitive survey of this issue, concerns regarding such burning have been raised at several of the Stakeholder meetings.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will impose special regulatory licensing requirements for the import, manufacturing, sale, use and/or distribution of the pesticide commonly known as DDT. It is recognized that DDT is useful in controlling malarial mosquitoes, but it also recognizes that DDT is a Persistent Organic Pollutant and should be subject to strict licensing and controls for its import and use. Each import and/or use will be subject to a separate application for permit to use and such Permits will only be granted by the Hazardous Materials and Hazardous Wastes Management Board if all other potential pesticides have been shown not to work effectively. Dominica will register this exemption with the Stockholm Convention and has established an Action/Management Plan.

Other Pesticides and Hazardous Materials

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will ban the import, manufacturing, sale, use and/or distribution of 31 chemical substances (pesticides and industrial chemicals) listed as Annex III of the Rotterdam Convention and not currently listed in Annexes of the Stockholm Convention: 1,2-dibromomethane (EDB), ethylene dichloride, fluoroacetamide, HCH, lindane, mercury compounds, monocrotophos, parathion, pentachlorophenol, methamidophos, phosphamidon, methyl parathion, polybrominated biphenyls (PBB), polychlorinated terphenyls (PCT), tetraethyl lead, tetramethyl lead, Tris, and dustable powders containing >7% benomyl or >10% of carbofuran or >15% thiram.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will ban the import, manufacturing, sale and/or distribution of products containing more than 1% by weight of asbestos in the mineral forms of Crocidolite, Actinolite, Anthophyllite, Amosite and Tremolite.

The Commonwealth of Dominica recognizes that some special products may include more than 1% of asbestos by weight and specific exemption permits may be granted for the importation and use of such products in Dominica. However, each import activity is subject to a new exemption permit request to ensure such activities are minimized. The Commonwealth of Dominica will establish regulations under the proposed *Hazardous Materials and Hazardous Wastes Management Act* to control the current use, removal, handling and disposal of asbestos-containing materials, as part of a broader effort to provide environmentally-sound management of hazardous materials.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will regulate ethylene oxide, with a requirement for special exemption permits for the import, sale, distribution and use.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will promote a reduction in the generation of hazardous wastes - both in terms of quantity and hazard risk, through the promotion of cleaner production technologies and methods.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will promote and develop an environmentally sound management process for hazardous materials and hazardous wastes through a programme of legislation, regulations and enforcement. Further, the Act and associated regulations will promote the concept of integrated life-cycle approach through careful management of the generation, storage, transport, treatment, reuse, recycling and disposal of all hazardous materials and wastes.

The proposed regulation will phase out by 2010 the importation, and/or consumption of ozone-depleting substances and halons whether as individual compounds, mixed compounds, equipment containing these compounds or mixtures of compounds or as substances used in the manufacture of flexible or rigid insulation foam or as substances used in the manufacture of plastic packaging.

The proposed "Terminal Phase Out Management Plan", will institute a programme which is a policy within the country's programme for the safe removal from all equipment or fire-suppressant equipment, chlorofluorocarbons and halons with complete removal by a specified date (2010). Some systems will be permitted under special exemption.

Register for Exemptions and Continuing Need for Exemptions

Continuing the existing policy and regulation, the new legislation will include a requirement for the registration of all pesticides, as well as extending the registration process to include all related chemical substances and all other hazardous materials; the latter defined by the United Nations Global Harmonized System for material designation. Continuing with present regulation, to import a "new" product, application will be made to the Hazardous Materials and Hazardous Wastes Management Board for review and approval. All product registrations are for a two year period and application for renewal must be made within six months of the end of the registration. The Management Board will maintain a list of registered products and have this list published once per year in the Official Gazette and provided to primary importers.

The new *Hazardous Materials and Hazardous Wastes Management Act* will require the complete cessation of import, manufacturing, sale, use and/or distribution of eight Persistent Organic Pollutants, commonly known as: endrin, toxaphene, aldrin, dieldrin, heptachlor, chlordane, hexachlorobenzene and mirex. This will not impose any financial or use burdens, as the products are not currently imported or used in Dominica. There will be no requirement for exemptions for these compounds.

The new *Hazardous Materials and Hazardous Wastes Management Act* will require the complete cessation of import, manufacturing, sale, distribution or export for sale of polychlorinated biphenyls or any equipment or products containing such chemical compounds, where the definition of "equipment or products containing polychlorinated biphenyls" is having a

concentration of more than 50 mg/Kg.

Currently, there is a limited amount of electrical and related equipment in service and which contain polychlorinated biphenyls at a concentration of more than 50 mg/Kg. A Registered Exemption will be provided to the owners of the equipment (primarily DOMLEC, the electrical utility) to 1 November 2008, by which time the owners will have removed this equipment from service and properly disposed of the PCB oils. Exemption will be provided to the owners of fluorescent light ballasts containing polychlorinated biphenyls (typically ballasts manufactured before 1979-1983) to 1 November 2010, by which time the owners will have removed this equipment from service and properly disposed of the PCB containing ballasts. By 1 November 2010, all equipment and products containing polychlorinated biphenyls will be removed from service and properly disposed. After that date, there will be no exemptions.

The new *Hazardous Materials and Hazardous Wastes Management Act* will ban the import, manufacturing, sale, use, generation and/or distribution of any polychlorinated dibenzo furans and any polychlorinated dibenzo dioxins. To limit the accidental generation and release of any polychlorinated dibenzo furans and any polychlorinated dibenzo dioxins, the new Act will prohibit the burning or combustion at temperatures of less than 1000 ^{o}C of any plastic materials, polychlorinated biphenyls, any organochlorine pesticide, equipment or products containing polychlorinated biphenyls at concentrations greater than 10 mg/Kg or any container formerly used to contain polychlorinated biphenyls or any organochlorine pesticide. There will be no exemptions for these substances.

All of the unintentional release of PCDD's and PCDF's has been via "backyard" or barrel burning of plastic wastes and general garbage. Part of this is due to habit and part is due to lack of separate collection capacity by the Dominica Solid Waste Management Corporation.

Therefore the Government of Dominica will implement a PCDD's-PCDF's Control Action Plan with the following elements:

- Backyard or barrel burning of plastics, particularly pesticide containers and banana fungicide blue bags is banned.
- Failure to comply with the ban will result in a minimum fine of EC$300, with fines doubling for each subsequent charge to the same person or property owner.
- The Dominica Solid Waste Management Corporation will implement a separate system for the collection of plastics, particularly of pesticide containers and banana fungicide bags. The system of collection will be augmented by implementation of a levy on each pesticide container at the point of retail sale and the return of this levy, if the container is returned to the point of sale.
- A survey will be conducted during the Action Plan to assess the scope of generation of PCDD's and PCDF's throughout Dominica by the backyard or barrel burning of plastics.
- The Dominica Solid Waste Management Corporation is currently having a biomedical waste two-stage incinerator installed and commissioned to properly deal with the disposal of such wastes, while avoiding the unintentional generation of PCDD's and PCDF's during biomedical waste treatment. The biomedical wastes will be all "red bag"

wastes from the hospitals, clinics, veterinary clinics and dental offices. The incineration system will also deal with foreign "quarantine" wastes from ships and airplanes.

- As with other hazardous materials, the Hazardous Materials and Hazardous Wastes Management Board can by special permit, allow for the import and use of small quantities of PCDD's and PCDF's for the purposes of analytical testing and/or research and development.

The new *Hazardous Materials and Hazardous Wastes Management Act* will provide a Regulatory Exemption to permit the import, manufacturing, sale, use and/or distribution of a pesticide commonly known as DDT. The activities will be controlled through a requirement for a Permit to Import and a (separate) Permit to Use. This Continuing Exemption recognizes the key role of DDT in controlling malarial mosquitoes. The Permit system acknowledges DDT is a Persistent Organic Pollutant and should be subject to strict controls for its import and use.

DDT ACTION PLAN

Responsible Parties: Hazardous Materials and Hazardous Wastes Management Board and the Ministry of Health (Environmental Health Department)

The Government of Dominica recognizes that DDT is a very effective pesticide in the control of mosquitoes as vectors for malaria and therefore will not institute a complete ban on the pesticide. The Government of Dominica also recognizes other pesticides are now available for the control of mosquitoes and, while not as effective, these pesticides do not have the associated issues of persistence and bioaccumulation properties of DDT.

Therefore the Government of Dominica will implement a DDT Action Plan with the following elements:

1. Any existing stocks of DDT or goods containing more than 0.1% DDT will be collected and removed from general use.
2. The import, sale, distribution, or formulation of DDT or products containing more than 0.1% DDT is banned.
3. An exception, by special permit, may be made by the Hazardous Materials and Hazardous Wastes Management Board, to allow the import of small quantities (less than 0.25L) of DDT or products containing more than 0.1% DDT for the purposes of analytical testing and/or research and development.
4. If an outbreak of malarial vector mosquitoes is identified in Dominica, the Ministry of Health will first attempt control using pesticides that are not Persistent Organic Pollutants.
5. If the outbreak cannot be controlled and contained by other pesticides, the Ministry of Health can make application to the Hazardous Materials and Hazardous Wastes Management Board for a special permit to import a DDT containing product ("permit of last resort").
6. This special permit is a "one-time only" permit.
7. Only an applicator, licensed by the Ministry of Health and approved by the Hazardous Materials and Hazardous Wastes Management Board can use the imported product.
8. The general public in the area of the pesticide application must be warned by signage, media announcements and leaflets, at least 72 hours in advance of the pesticide application.
9. The pesticide can only be manually sprayed. There can be no use of aerial spraying of any format.
10. Any unused amounts of pesticide must be returned to the source of import and removed from Dominica.
11. Dominica will register this exemption with the Stockholm Convention Secretariat.

Identification of Stockpiles, Articles in Use and Wastes

Please refer to Appendix 4 for more details and supporting information.

Persistent Organic Pollutants

There are no facilities for the manufacture of any of the Persistent Organic Pollutants of any type on Dominica or use of any of the Pollutants to manufacture other products; all products are imported.

Surveys of over 1178 farms, 117 retail outlets and 58 hotels/guesthouses, conducted in January-February 2006 indicated there was no current use of, or stockpiles of products or stockpiles of wastes of the eight Persistent Organic Pollutants, commonly known as: endrin, toxaphene, aldrin, dieldrin, heptachlor, chlordane, hexachlorobenzene and mirex. However, farmers did indicate limited past use of aldrin, dieldrin and mirex. As part of the Action Plan, this survey will be extended to the remaining unsurveyed 5400 farms on Dominica, with the information compiled into the Pesticides Use Database. This survey is proposed to be conducted during the first year of the National Implementation Plan. It should be noted that the initial survey included most of the banana farms and provided a full coverage of all agricultural districts of Dominica.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will provide a timetable for the cessation of the use of polychlorinated biphenyls in any form of electrical equipment and proper disposal of such materials, including fluorescent light ballasts.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will ban all open-air burning and thereby limit the accidental formation of polychlorinated dibenzo furans and polychlorinated dibenzo dioxins. To facilitate this activity, the Dominica Solid Waste Management Corporation will implement a system of pesticide container and banana fungicide bag collection, separate from collection of other solid wastes. This process will also ensure proper disposal of such materials.

Other Pesticides and Hazardous Materials

There are no facilities for the manufacture of pesticides of any type or use of any of the compounds to manufacture other products on Dominica; all products are imported.

The survey of 1123 farms and 105 retail outlets, conducted in January-February 2006 indicated there was extensive use of other pesticides, particularly glyphosate, an organophosphorus herbicide, various fungicides (non-organochlorine) specific to the banana industry and various insecticides (non-organochlorine) specific to the banana industry. Several of these products were also noted at vegetable and fruit farms, particularly glyphosate and sevin (carbamate insecticide). A survey in April 2006, indicated several retail outlets carried large amounts of pesticides (mostly non-organochlorine); e.g., one retail outlet had 25 cases (500 mL x 12) bottles of Roundup (glyphosate) in their storeroom and 2 opened cases on their display shelves.

As part of the Action Plan, this survey will be extended to all 6500 farms on Dominica, with the information compiled into the Pesticides Use Database.

The proposed *Hazardous Materials and Hazardous Wastes Management Act* will impose stricter controls on the storage and display of all pesticides and hazardous materials, as well as the provision of a Workplace Hazardous Materials Information System centre and appropriate Material Safety Data Sheets.

During the March survey, two stockpiles of "stale-dated" or "unacceptable" pesticides were observed:

(1) Five pesticides belonging to a former Banana Producers Company and now stored in a government warehouse in Canefield (Benlate OD, Kelthane, Anvil 25WSC, Vermitec and Actellic); and
(2) An unknown number and type of pesticide stock buried in the former Stockfarm (Roseau) landfill.

An element of the Action Plan will be the collection and off-island disposal of the waste stockpile at the Canefield warehouse. The proposed Act will limit the formation of such stockpiles in the future.

Most farmers dispose of their waste pesticide containers and the special plastic bags used for the application of fungicides on bananas as part of the regular garbage collection. The container and plastic bags are placed in a lined landfill at Fond Cole Solid Waste Facility. There is no attempt to separate out such wastes. Observations during site surveys indicated many containers were also simply buried on farms. To facilitate proper container disposal, the Dominica Solid Waste Management Corporation will work with MoAFE and the farmer organizations to implement a system of pesticide container and banana fungicide bag collection, separate from collection of other solid wastes.

As part of the Action Plan, five activities have been recommended at the Stakeholder or NCC meetings to address the current practice of disposal of waste containers and bags:

(1) A detailed public awareness campaign;
(2) Re-introduction of "Pesticide Awareness Week" to promote more environmentally-sound farming practices and appropriate disposal of waste stocks and containers.
(3) Introduction of "Household Hazardous Waste Days" to encourage householders throughout Dominica to properly dispose of waste pesticides and pesticide containers, rather than simply with the regular garbage.
(4) Provision of a separate collection system for pesticide containers and banana fungicide bags.
(5) Provision of better handling facilities at the Fond Cole Solid Waste Facility for waste hazardous materials, hazardous wastes and hazardous waste containers.

Management of Stockpiles and Measures for Handling and Disposal of Articles in Use

As noted above, there are no stockpiles of the Persistent Organic Pollutants and therefore no

special measures to manage stockpiles or to dispose of articles in use is required in the Action Plan.

With respect to the two stockpiles of other pesticides, the Action Plan will include disposal of the warehouse stockpile and an assessment of the feasibility of excavating the other stockpile and disposing of those materials.

Measures to Reduce Releases from Stockpiles and Wastes

Please refer to Appendix 4 for more details and supporting information.

The burning of plastics at the Jimmit Solid Waste Facility will be stopped in 2006 by the Dominica Solid Waste Management Corporation. The individual burning of plastics will be encouraged to stop through public awareness campaigns, beginning in 2006, and provision of more opportunities to properly dispose of plastic wastes.

The Action Plan includes provision of the designation of one person within the Dominica Solid Waste Management Corporation to assume responsibility for the collection and proper disposal of all pesticide wastes, pesticide waste containers, other hazardous wastes and other hazardous waste containers. The Action Plan includes provision for the construction of a small building at the Fond Cole Solid Waste Facility to facilitate the separation and proper storage of hazardous and pesticide waste containers and other hazardous wastes. By having such a building at Fond Cole, Dominica can better monitor wastes and any associated releases.

Identification and Remediation of Contaminated Sites

Please refer to Appendix 4 for more details and supporting information.

Activities at the existing Jimmit Solid Waste Facility, and smaller private sites were reviewed as part of the Enabling Activity Project to determine the potential for contamination due to Persistent Organic Pollutants. On the basis of soil sampling (see details in Appendix A-4-4) and site inspections by environmental professionals, detectable concentrations of several Persistent Organic Pollutant pesticides and polychlorinated biphenyls was identified. Further, as the two sampling sites showed evidence of product burning/fires, there is a high potential for several of these sites to be contaminated due to PCDF's and PCDD's (open low temperature burning of plastic bags and computer equipment covers),. Also as the two sample sites showed evidence of the plastic having been burned off lead vehicle batteries, there is a strong potential (not tested) for contamination by lead, zinc, cadmium and other trace metals (open low temperature burning of metal parts and old vehicles).

To address the Jimmit Solid Waste Facility contamination issue, an Action Plan described below, will be implemented as an element of the National Implementation Plan:

JIMMIT WASTE FACILITY ACTION PLAN

Responsible Party: Dominica Solid Waste Management Corporation, with technical assistance provided by Ministry of Agriculture, Fisheries and the Environment through the relevant department.

Actions:

1. Immediate cessation of all burning of materials of any type at the site.
2. Clean-up and removal of all wastes, of any type along the shoreline, both in front of the Jimmit site and to the north and south.
3. Removal of all materials not classed as “derelict vehicles”.
4. Separation during removal of any materials that can be readily classed as “hazardous wastes” (e.g., lead vehicle batteries) with separate storage and subsequent off-island disposal of such wastes.
5. Separation during removal of all plastic wastes, of any form, with shipment of such wastes to the regional plastics recovery facility.
6. Removal and compression of all derelict vehicles and metal components. Temporary storage of such materials at the former Portsmouth Landfill site.
7. Fencing of the site to ensure no public access to limit exposure to contaminants.
8. Excavation of 25 test pits to at least -2 m depth and collection of 3 soil samples per test pit. All pit locations to be properly surveyed and located on a surveryor’s site plan.
9. Approximately 75 samples to be tested for suite of organochlorine pesticides, PCB, suite of trace metals and 5 surface samples for PCDD’s and PCDF’s.
10. Detailed review and interpretation of data to provide three dimensional mapping of contaminants on site.
11. Development of Remedial Action Plan to address contaminated soils issue.
12. Contaminated soil to be removed and treated/disposed.
13. Site to be infilled with new clean fill and alternate uses identified and developed.

In response to Stakeholder concerns regarding other "potential" contaminated sites, the Action Plan will provide for adoption of an Environmental Site Assessment protocol and use of the Protocol to assess at least two sites. The Site Assessments will follow standard internationally-recognized procedures for site sampling (soils and groundwater), materials testing and detailed evaluation of information. On the basis of this information, the Hazardous Materials and Hazardous Wastes Management Board will initiate remediation of the various contaminated sites. Technologies may have to be imported to provide for treatment of the waste soils.

In further response to Stakeholder concerns regarding these sites, the new *Hazardous Materials and Hazardous Wastes Management Act* will contain a specific set of regulations (Guidelines for Assessment and Management of Contaminated Sites) to define a "contaminated site", to define how such a site will be assessed and to define how such a site is to be remediated to meet specifications as to "acceptable risk for re-use" and "managed risk for re-use" and "managed risk subject to significant restrictions".

With respect to any pesticide, a property or site will be defined as "contaminated" if the soil is found to contain more than 0.5 mg/Kg of any one pesticide or if the groundwater or surface water is found to contain more than 0.1 mg/L of any one pesticide. With respect to polychlorinated biphenyls, the concentrations will be (soil) 10 mg/Kg and (groundwater or surface water) 100 ug/L. For polychlorinated dibenzofurans and polychlorinated dibenzodioxins, the concentrations will be (soil) 0.1 mg/Kg (TCDD equivalents) and (groundwater or surface water) 0.1 ug/L (TCDD equivalents). With respect to petroleum hydrocarbons, a residential or agricultural property or site will be defined as "contaminated" if the soil or groundwater is found to contain more than specified concentrations of BTEX components (benzene, toluene, ethyl benzene, xylenes) or Total Petroleum Hydrocarbons, based on whether the property is residential or commercial use.

The Environmental Site Assessment process to determine if a property or site is contaminated will consist of six phases:

(1) Historical review of uses of the site and the potential for site contamination, combined with a site review by a suitably training professional.
(2) Collection of soils by borehole or testpit and collection of surface water and collection of groundwater by appropriate monitoring wells. All work to be planned and supervised by a suitably trained professional. All laboratory analyses conducted by an approved and certified laboratory.
(3) Full interpretation of all site information to provide a detailed three-dimensional delineation of contamination.
(4) Preparation of a Remedial Action Plan with specific objectives to address the contamination delineated in Phase 3. All work to be planned and supervised by a suitably trained professional.
(5) Implementation of the Remedial Action Plan, with suitable monitoring to ensure remedial objectives are being met. All work to be planned and supervised by a suitably trained professional.

(6) Closure survey to provide through soil and groundwater sampling adequate proof that the property or site has been fully remediated to meet the remediation objectives. All work to be planned and supervised by a suitably trained professional.

The Environmental Site Assessment process will be the responsibility of the property owner or MoAFE, if the owner cannot be identified or is bankrupt. The report(s) will be provided to the Environmental Coordinating Unit for review and concurrence with the findings and conclusions. The reports will also be placed with other legal documents regarding the property in the Ministry of Lands, so that any future property owner can be fully aware of environmental liabilities associated with a particular parcel of land.

All contaminated soils and/or groundwater and/or surface waters will only be disposed/treated under the supervision and approval of the MoAFE, through the relevant department and the Dominica Solid Waste Management Corporation.

If a property or site can be fully remediated to meet objectives with resultant closure survey concentrations less than the specified concentrations, the property or site will be re-classified as "acceptable risk for site re-use" or "fully cleaned". This means there will be no limitations on site re-use.

If, due to costs, a property or site cannot be fully remediated, then the property will be owned, sold and used under either "managed risk for re-use" and "managed risk subject to significant restrictions". In these cases, there will be limits imposed on the re-use of the property or site, such as a requirement to pave the site and use only for parking, etc.

Facilitating Information Exchange and Stakeholder Involvement

Throughout the Enabling Project and the development of the National Implementation Plan, there has been a high degree of Stakeholder involvement and participation. This has been partially accomplished through a diverse group of stakeholder interests represented in the membership of the National Coordinating Committee and by the excellent degree of representation of the wider stakeholder community participation in five major Consultative Meetings held in Roseau and five rural communities (Marigot, Portsmouth, Salisbury, Grande Bay and La Plaine) (see information on these meetings, lists of attendees and findings and recommendations in Appendix A-2).

To continue Stakeholder involvement in the National Implementation Plan, the Action Plan provides for re-profiling of the Enabling Activity Project National Coordinating Committee to the formation of a National Advisory Committee for Hazardous Materials. This Committee will advise and consult with the Hazardous Materials and Hazardous Wastes Management Board, but be appointed by the Government of Dominica.

In addition, there will be a continuation of the Stakeholder Consultative meetings on an annual basis to report on the previous year of activities, as summarized in the Annual Report on Management of Hazardous Materials and Wastes, and solicitation of Stakeholder comment on potential changes to the Policy and the Act to maintain agreement with the current statements and objectives of the five Conventions.

Public Awareness, Information and Education

The January-February 2006 survey of 1123 farmers in Dominica indicated few, if any, knew about Persistent Organic Pollutants, the Stockholm Convention or the other related Conventions. Therefore the Environmental Coordinating Unit of the Ministry of Agriculture, Fisheries and the Environment has developed and delivered on a series of public announcements, media new briefings, television and radio interview shows and information leaflets.

A more coordinated and in-depth programme will form a key element of the Action Plan. As several stakeholders have identified, delivery of the message to schools and young people will be critical to successful implementation. One of the activities of the proposed ECU officer will be development and delivery of information programmes to the public.

MoAFE, through the relevant department will coordinate all public education and awareness campaigns. These campaigns will extend throughout the three year horizon of the project implementation period.

Effectiveness and Evaluation

As outlined in Tables 3.6-1 and 3.6-2, the National Coordinating Committee and Stakeholders have adopted a set of Objectives, Targets, Performance Indicators and Milestones for implementation of the Action Plan. Three evaluation activities have been identified, as described below, each of which will be used to test the effectiveness of objectives and targets to ensure the overall goals of the Project are being met.

The Evaluation Activities will be conducted by MoAFE through the relevant department, acting as chairs of evaluation working groups of stakeholders.

Evaluation Activity #1 will occur at each date specified in “Targets”. The “Target” specifies the scope of activity to be completed by a specified date and the “Performance Indicators” specify how the effectiveness of the Activity is to be evaluated.

Evaluation Activity #2 will occur at each date specified in “Milestones”. As described in Tables 3.6-1 and 3.6-2, Milestones occur at the completion of a series of Targets. The scope of activity and the date of the Milestone are specified.

Evaluation Activity #3 will occur annually and will consist of a review of all activities forming the National Implementation Plan, not to test that specific Targets are being met, but to ensure the

overall strategy and progress of the Plan are being met; e.g., Are there specific bottlenecks occurring, so that a series of Targets will not be met due to resource allocations? Are there Targets being met well within specified times, permitting a re-allocation of resources?

Reporting

Each year, the Hazardous Materials and Hazardous Wastes Management Board will prepare an Annual State of the Management of Hazardous Materials and Hazardous Wastes. This document will be forwarded to Parliament and with their approval, then submitted to the Secretariats of the five Conventions, to the Global Environment Facility, to the United Nations Environment Programme and placed on the Project Web Site to provide for full public disclosure. Information will be presented in a format suitable for each of the Conventions; e.g., Persistent Organic Pollutants, Prior Informed Consent, etc.

The Report will contain relevant information on new products registered for use, re-registration of older products, itemized lists of regulatory activities (including Ministerial Orders, summary offence notices), summary of public awareness campaigns, summary of stakeholder meetings, summary of activities of the Hazardous Materials and Hazardous Wastes Management Board and summary of comments and recommendations by the National Hazardous Materials and Wastes Advisory Committee.

Research, Development and Monitoring

Other than very limited capacity at the current Crop Protection Laboratory and within the current resources and available personnel at the Environmental Coordinating Unit, there is no capacity in Dominica to conduct research and development or monitoring. Currently, Dominica is a participant, through CARICOM, in the Caribbean Environmental Health Institute (CEHI) based in Saint Lucia and which has a laboratory certified to conduct pesticide analyses.

To overcome the capacity issue, two approaches are proposed:

1. For Research and Development, agreements with the University of West Indies, the Caribbean Research and Development Institute (CARDI) and the Inter-American Institute for Cooperation in Agriculture (IICA) will be developed and implemented. Graduate students will be encouraged to conduct research programmes in Dominica to evaluate such topics as: persistence of pesticides in the Dominican climate and soil conditions, efficacy of pesticide applications for different crop types and residual pesticides in local fauna and flora. Further, the University of West Indies will be encouraged to set up a research facility at the new Centre for Excellence to facilitate on-island field research by graduate students and outside researchers.

2. Through application of a hazardous materials import levy, the Hazardous Materials and Hazardous Wastes Management Board will obtain funding to conduct monitoring studies of field pesticide application. The scope of these monitoring programmes will be reviewed in conjunction with the Technical Steering Committee of the Hazardous

Materials and Hazardous Wastes Management Board, the National Hazardous Materials and Wastes Advisory Committee, Dominica Banana Growers Association, Fair Trade Association, etc.

Technical and Financial Assistance

As detailed in Tables 3.7-1, 3.7-2 and 3.7-3, the total cost is estimated as US $1,906,000, of which US $762,000 is incremental and US $1,144,000 is baseline. The details for the three aspects are:

- Legislative/Regulatory: US $97,000 ($84,000 incremental, $13,000 baseline).
- Administrative: US $846,000 ($47,000 incremental, $799,000 baseline).
- Infrastructure: US $953,000 ($5511,000 incremental, $402,000 baseline)

"Baseline" costs will form the contribution by the Government of Dominica. Financing of the incremental factor will be sought from international agencies, primarily the Global Environment Facility through the United Nations Environment Programme and the Government of Canada POP Fund.

3.5 DEVELOPMENT AND CAPACITY-BUILDING PROPOSALS AND PRIORITIES

Legislative And Regulatory

At this time, the Commonwealth of Dominica relies on the *Pesticides Control Act* of 1974 (with amendments in 1981) and the *Noxious and Dangerous Substances Act* of 1982, as the means to regulate pesticides and hazardous materials. Further the Commonwealth of Dominica is currently reviewing a bill entitled the *Pesticides Control and Toxic Substances Control Act*, which will replace the current Acts and provide the national implementation of the Chemical Weapons Convention. The existing and draft Acts do not fully address the management of persistent organic pollutants that are not pesticides, do not provide national legislation to implement the Stockholm Convention and do not provide for future changes to address changes or additions to the Stockholm Convention. Further, the existing and proposed Acts also do not fully address the management of hazardous materials and hazardous wastes that are not pesticides, do not provide national legislation to implement the Rotterdam Convention, the Basel Convention or the Vienna Convention/Montreal Protocol and do not provide for future changes to address changes or additions to the various Conventions.

A key initial element of the Action Plan will be the drafting, Parliamentary approval, and proclamation of a new *Hazardous Materials and Hazardous Wastes Act*, as well as associated regulations. This Act and regulations will provide the basis to the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes. The new Act will also provide the national legislation forming part of the obligations as Party to the Stockholm Convention and other Conventions.

The new legislation and regulations will address:

- Incorporation of features of the proposed *Pesticides and Toxic Substances Control Act*.

- Provision of regulations controlling the import, use, storage, handling, distribution and disposal of all types of pesticides, including those intended for agricultural, forestry, construction-related and household uses. The proposed Act would provide three lists of substances: List 1 would include the 9 Group I Persistent Organic Pollutant pesticides and ban the import, use or disposal of these compounds; List 2 would include 31 other pesticides listed in the Rotterdam Convention (not forming part of the Phase I POP list) and would ban the import, use or disposal of these compounds; and, List 3 would include other pesticides now registered for use on Dominica, so as to provide a basis for their proper management and regulation; List 4 will include all pesticides and hazardous materials not currently registered for use on Dominica; List 5 will include the Annex A chemical substances and products of the Chemical Weapons Convention and List 6 will include the Annex B chemical substances and products of the Chemical Weapons Convention.

- Implementation of the Basel Convention on transboundary movement of hazardous wastes and the Vienna Convention on Ozone-Depleting Substances.

- Provision of the placement of other pesticides on the three lists as either the Stockholm or Rotterdam Conventions are modified or application was made for new pesticides to be used on Dominica.

- Provision of regulations regarding other hazardous materials and wastes; their import, use, storage, distribution, handling and disposal.

- Provision of regulations regarding the management of contaminated sites; how to define a contaminated site, how such a site is assessed, how such a site should be managed, how it should be remediated and how to define a “cleaned” site.

- Provision of regulations regarding the identification of hazardous materials and wastes, during handling, packaging, transport and storage, using the United Nations Global Harmonized System.

- Provision of regulations to protect workers handling, using, storing or disposal of pesticides. The purpose would be not to burden the farmer with unnecessary regulation, but to ensure their health and the health of their families and workers is reasonably protected.

- Provision of regulations to protect workers handling all types of hazardous materials and wastes, including the provision of a Workplace Hazardous Materials Information System (Material Safety Data Sheets). These regulations would include personal protective equipment, provision of warning labels, signs and emergency response information.

- Incorporating the existing Pesticides Control Board into a new Hazardous Materials and Hazardous Wastes Management Board, with provision of a Registrar/Executive Director. This person would have appropriate technical qualifications to assist the Board in their deliberations, would conduct the general business of the Board and would act as the chair of the Technical Advisory Committee. As the Board would manage a broader set of materials, its membership would be broadened to include appropriate other ministries, such as Trade.

- National implementation of the Stockholm Convention on Persistent Organic Pollutants, the Rotterdam Convention on Prior Informed Consent and the Basel Convention on Transboundary Movement of Hazardous Wastes.

- National implementation of the Vienna Convention on Ozone Depleting Substances and the associated Montreal Protocol.

Government Institutional Capacity

With proclamation of the *Hazardous Materials and Hazardous Wastes Act*, the Commonwealth of Dominica will implement the following administrative changes to facilitate enhanced management of such materials and wastes.

- **Hazardous Materials and Wastes Management Board.** The existing Pesticides Control Board is proposed to be incorporated into a new Hazardous Materials and Hazardous Wastes Management Board, with provision of a Registrar/Executive Director. This person would have appropriate technical qualifications to assist the Board in their deliberations, would conduct the general business of the Board and would act as the chair of the Technical Advisory Committee. As the Board would manage a broader set of materials, its membership would be broadened to include appropriate other ministries, such as Trade. The Government will provide support funding to cover salary and expense costs and cover the cost of provision of outsider expertise, on an as-needed basis.

- **Pesticides Regulation**. Three Agriculture Extension Officers will be assigned duties as Pesticide Control Officers, with broader powers of enforcement with respect to licensing facilities to sell pesticides, as well as the use, storage, handling, distribution and disposal of pesticides. The requirements for improved regulations will be addressed by the proposed new Act.

- **Hazardous Materials Regulation**. Two staff within the Dominica Bureau of Standards (Ministry of Trade) will be designated as Hazardous Materials Control Officers, with duties to address the labelling, handling, transport, and storage of all hazardous materials and wastes. The primary role of the Hazardous Materials Control Officers will be to assess handling and transport, to ensure all such activities meet the United Nations Global Harmonized System (UNGHS) and the International Maritime Dangerous Goods (IMDG) Code systems of material identification, labelling, placarding and provision of

Material Safety Data Sheets. The Hazardous Materials Control Officer(s) will work with the Dept. of Labour inspectors and Environmental Health inspectors in the inspection of facilities that handle, store and sell non-pesticide hazardous materials to ensure compliance with the Workplace Hazardous Materials Information System and provision of information to workers.

- **Hazardous Wastes Reception and Disposal.** One person within the Dominica Solid Waste Management Corporation will be designated as responsible for reception and disposal of hazardous wastes, of all types. This will include waste pesticide containers, waste banana blue bags, biomedical wastes, assessment of refrigerant systems before disposal to ensure proper removal of ozone depleting substances, hazardous and contaminated waste construction and demolition materials, contaminated soils and miscellaneous containers and materials. The regulatory requirements will be addressed under the proposed new Act. The new staff member would also be responsible for assessing hazardous materials disposal within the normal solid wastes delivered to the Fond Cole Solid Waste Facility, provision and delivery of public information and awareness campaigns and organization of collection days specifically designed to encourage proper household and farm hazardous wastes and containers disposal (e.g., Household Hazardous Waste Day).

- **Labour Department and Environmental Health.** Additional powers of inspection and regulation will be given to Labour Department inspectors and Environmental Health officers to facilitate full compliance with the proposed provisions of the Workplace Hazardous Materials Information System.

- **Environmental Coordinating Unit activities.** One person within the Environmental Coordinating Unit of the Ministry of Agriculture, Fisheries and the Environment will be given specific roles to facilitate (1) provision of strategic overview on the issue of hazardous materials and wastes; (2) coordination of various stakeholder interests through chairing of a annual meetings; and, (3) ensuring Dominica continues to meet its signatory obligations under the Stockholm Convention on Persistent Organic Pollutants, the Rotterdam Convention on Prior Informed Consent, the Basel Convention on the Control of the Trans-Boundary Movements of Hazardous Wastes and Their Disposal and the Vienna

- **Hazardous Materials Registration and Permit System**. Currently, only pesticides are regulated under a three-year registration system. This system will be extended to require all materials classed under the United Nations Global Harmonized System as “hazardous” to require a permit for import, sale, use, distribution or disposal within Dominica. This registration and permit system will be maintained by the new Hazardous Materials and Hazardous Wastes Management Board.

- **Implementation of Hazardous Materials and Wastes Tracking System.** To monitor the import, distribution, sale and/or use of any persistent organic pollutant, other pesticide

or any other hazardous materials and wastes in Dominica, an appropriate labelling or code system will be purchased and commissioned. All information will also be entered into a computerized system that will provide for all products to be tracked from the time of entry at the Port, through transport/handling/storage to sale to the user and thence disposal of the waste container at the Solid Waste Management Corporation facility.

- **Hazardous Wastes Facility.** The Dominica Solid Waste Management Corporation will construct a suitable facility at Fond Cole for the handling, storage or re-packaging of hazardous wastes of any kind, including pesticide containers or banana blue bags.

- **Extension of the existing Farm/Store/Hotel User Information Database.** The Dominica Persistent Organic Pollutants Enabling Activity Project financed the initial survey of 1178 farms, 117 stores and 58 hotels/guesthouses. The survey forms will be enhanced in response to stakeholders' comments and recommendations and the survey extended to include all farms, stores selling pesticides or hazardous materials and hotels. Also the survey will include other potential hazardous materials sites, such as gasoline service stations. These data will be input into the existing database.

- **Pesticide Residues Laboratory.** As part of the proposed National Centre for Excellence, the current Crop and Food Testing Laboratory will be expanded. The new Centre will include capacity to properly extract all forms of pesticides from soils, sediments, food stuffs, forest products and fish for the purposes of subsequent testing. However, due to the high capital and maintenance costs of having capacity for analytical determination of all pesticides, the Commonwealth of Dominica will enter into a two-year agreement with the Caribbean Environmental Health Institute for that Institute to complete the required analyses of the extracted samples. After the two-year trial period, the Hazardous Materials and Hazardous Wastes Management Board will re-assess the arrangement to ensure it continued to meet Dominican needs for residue analyses in food, soils, sediment and environmental samples.

- **Toxic Substances Referral Centre.** To minimize health concerns regarding accidental exposure or consumption of hazardous materials and hazardous wastes, the Commonwealth of Dominica will establish a Toxic Substances Referral Centre at the primary health centre in Roseau. This centre will be able to provide by 24/7 telephone or Internet contact, relevant information to medical and health services staff throughout Dominica. The Centre will also be able to provide information to first responders as to the nature of products being transported or stored, using the UNGHS placarding and labelling system.

Private Business Institutional Capacity

Private business (importers, transport companies, storage facilities and sales/distributors and product users) will all play a key role in the implementation of activities in the Action Plan. However, as several surveys and stakeholder discussions have shown, both the government

and private sectors have significant need for institutional capacity development and enhancement. The Action Plan proposes the following measures:

- **Adoption of the UNGHS Placarding and Labelling System**. With official adoption of the new *Hazardous Materials and Hazardous Wastes Act*, all private businesses will be required to placarding all transport vehicles and places of storage and to ensure all materials are properly labelled and all shipments contain the proper Material Safety Data Sheets (MSDS).

- **Participation in the Hazardous Materials Tracking System.** With official adoption of the new *Hazardous Materials and Hazardous Wastes Act*, all private businesses will be required to participate in the Hazardous Materials Tracking System. In this system, all hazardous materials as they enter the country are to be entered into the Registry and then as items are sold or transferred, this information is also entered.

- **Improvements to Material Storage and Workplace Hazardous Material Information Systems.** With official adoption of the new *Hazardous Materials and Hazardous Wastes Act*, all private businesses will be required to ensure hazardous materials are properly stored in their warehouses or storage areas and to be safely displayed in retail sales outlets. Further, all businesses handling or using hazardous materials will be required to establish "Workplace Hazardous Materials Information System" sites or display units, to ensure all workers have full access to Material Safety Data Sheets.

These activities will require private businesses to have their staff undertake training, both at the initial stages of the program and as "refresher" courses about every three years. It is proposed that select senior private staff participate in training sessions with government agency counter-parts and then initiate a programme of training their staff. To facilitate training of staff at smaller private businesses, it is proposed local business associations (e.g., Dominica Banana Growers Association and Fair Trade Association) organize training programmes.

Monitoring

As Party to the various Conventions, the Commonwealth of Dominica is obligated to provide annual reporting on relevant activities to the Secretariats of each of the Conventions. The Hazardous Materials and Hazardous Wastes Management Board will assume overall responsibility for assessment of progress and monitoring of the National Implementation Plan. The Board will be assisted by the Environmental Coordinating Unit (Ministry of Agriculture, Fisheries and the Environment) and stakeholders which under the Enabling Activity was constituted as the National Coordinating Committee. Monitoring of the progress and success of the National Implementation Plan will consist of:

- **Annual Reviews.** Each year, the Hazardous Materials and Hazardous Wastes Management Board will chair a meeting of the National Advisory Committee. The purpose of the meeting will be to hold an annual review of changes or enhancements required in the policy, legislation, regulations or mode of implementation of the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes. The annual reviews will also serve to assist the Board in assembling and collating information that will be used to prepare Annual State of Hazardous Materials Report to be submitted to Parliament and, with their approval, to the Secretariats of the appropriate Conventions. The Board will also draw on information from the National Hazardous Materials and Wastes Tracking System and the Product Registration System.

- **Assessment of Targets and Milestones.** As outlined in Tables 3.6-1, 3.6-2 and 3.6-3, a series of times for Targets and Milestones have been identified. As each Target and/or Milestone is achieved, the Environmental Coordinating Unit will host a meeting of stakeholders to review the success of the Target and ensure performance indicators have been adequately met.

3.6 TIMETABLE FOR PLAN IMPLEMENTATION AND MEASURES OF SUCCESS

Introduction

For the purposes of the National Implementation Plan, the following definitions are used:

- **Goal** defines the overall direction set out in the Policy for the Environmentally-Sound Management of Persistent Organic Pollutants and Other Hazardous Materials and Hazardous Wastes.

- **Objectives** define the explicit end-points to be achieved for each of the specified goals. The Objectives also provide the time at which the end-point or deliverable is to be achieved.

- **Targets** define the stages leading to achievement of the Objectives. The Targets also provide the time for each of the stages. Typically, as a Target is reached, an evaluation is conducted to assess if Targets are being met within the Timetable set and that the Targets remain feasible.

- **Milestone** is not a term commonly used in Environmental Management Systems; however, for the Action Plan, Milestones have been established for a series of Targets. Also Milestones will be used to define the times when reports shall be issued to Parliament, the respective Conventions and funding agencies, as to success in implementation of the National Plan.

- **Performance Indicators** define how Objectives and Targets are met or are being met. For some Targets, there may be more than one Performance Indicator identified.

These components have all been developed from Stakeholder and NCC meetings held in March and April 2006. Various issues were identified in the National Profile components and surveys and from this information, various responses and response mechanisms were developed. The following text discusses the responses and response mechanisms for the Persistent Organic Pollutants and for the Other Pesticides and Hazardous Materials and Hazardous Wastes.

Persistent Organic Pollutants

The Targets, Objectives, Performance Indicators and Milestones for the management of Persistent Organic Pollutants are provided in Table 3.6-1.

For Persistent Organic Pollutants, four goals have been adopted:

- Ban the import, manufacturing, sale, use and/or distribution of eight Persistent Organic Pollutants.
- Ban the import, manufacturing, sale and/or distribution of polychlorinated biphenyls or any equipment or products containing such chemical compounds, where the definition of "equipment or products containing polychlorinated biphenyls" is having a concentration of more than 50 mg/Kg.
- Ban the import, manufacturing, sale, use, distribution and/or unintentional generation of any polychlorinated dibenzo furans and any polychlorinated dibenzo dioxins. The issue of unintentional generation is addressed through a specific action plan for this process.
- Institute special regulatory licensing requirements for the import and use of DDT or products containing more than 0.1% DDT. The import for sale and distribution of DDT or products containing more than 0.1% DDT is banned. Dominica will register this activity with the Stockholm Convention and has prepared a specific plan of action if use of DDT is required to control malarial mosquitoes.

From the adopted Objectives, Targets and Target Dates, the four key Milestones will be:

NIP start + 1 year	Cessation of 9 POP's
NIP start + 3 years	Cessation of PCB containing equipment and light ballasts
NIP start + 1 year	Virtual cessation of generation of PCDD's and PCDF's
NIP start + 1 year	Highly restricted use of DDT by special permit

Other Pesticides and Related Chemical Substances

The Targets, Objectives, Performance Indicators and Milestones for the management of Other Pesticides and Related Chemical Substances are provided in Table 3.6-2.

For Other Pesticides and Related Chemical Substances, four goals have been adopted:

- Ban the import, manufacturing, sale, use and/or distribution of 31 chemical substances (pesticides and industrial chemicals) listed as Annex III of the Rotterdam Convention and not currently listed in Annexes of the Stockholm Convention.
- The import, sale, distribution and use of ethylene oxide are permitted under a special exemption permit system.
- Promote and develop an environmentally sound management process for all pesticides and related chemical substances through a programme of legislation, regulations and enforcement and the promotion of pesticide alternatives.
- Institute a programme of public awareness and training for all pesticide importers, sellers/distributors and users.

From the adopted Objectives, Targets and Target Dates, the four key Milestones will be:

NIP start + 2 years	Cessation of 31 Chemical Substances
NIP start + 2 years	Pesticides under Management Process
NIP start + 2 years	Related chemicals under Management Process
NIP start + 1 year	Highly restricted use of Ethylene Oxide

Hazardous Materials and Hazardous Wastes

The Targets, Objectives, Performance Indicators and Milestones for the management of Hazardous Materials and Hazardous Wastes are provided in Table 3.6-3.

For Hazardous Materials and Wastes, nine goals have been adopted:

- Adopt the United Nations Global Harmonized System to identify and define all hazardous materials, hazardous wastes and other chemical substances
- Promote and develop an environmentally sound management process for hazardous materials and hazardous wastes through a programme of legislation, regulations, enforcement and enhancements to Government institutional capacity.
- Establish appropriate legislation and regulations to ensure adequate enforcement of the terms of the Basel Convention, in particular those sections dealing with documentation of the transboundary movement of all hazardous materials and wastes and the transboundary movement of hazardous wastes for the purposes of disposal.
- Ban the import, manufacturing, sale, distribution or export for sale of products containing more than 1% by weight of asbestos.
- Implement appropriate government institutional changes and capacity enhancements.

- Encourage private industry to adopt appropriate institutional changes and capacity enhancements.
- Institute a system for the environmentally-sound collection and disposal of hazardous wastes and associated containers.
- Institute a programme to remove old stockpiles of pesticides and other hazardous materials and properly dispose of these materials.
- Institute a programme to remediate any site or property defined as "contaminated".

From the adopted Objectives, Targets and Target Dates, the seven key Milestones will be:

NIP start + 2 years	Materials identification system in place.
NIP start + 2 years	Worker protection system in place
NIP start + 3 years	Highly restrictive use of asbestos products
NIP start + 1 year	Government component of Hazardous Material Management System implemented
NIP start + 1 year	Private business implement Hazardous Material Management System
NIP start + 2 years	Virtual elimination of old stocks of pesticides and hazardous material and system in place to collect hazardous wastes.
NIP start + 2.5 years	Major sources of old contamination assessed and remediated

Table 3.6-1: Timetable for Plan Implementation for Persistent Organic Pollutants and Measures of Success (All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
9 POP Compounds	Phase out and ban NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Remaining stocks gathered and stockpiled	+ 0.75 year	Volumes of materials gathered	
		Stockpiles disposed	+ 1 year	Volumes of materials disposed	
		Full ban in place	+ 1 year		Cessation of use and stockpiles of 9 POP's
PCB in Equipment	Phase out and ban NIP start + 2 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Remaining stocks gathered and stockpiled	+ 1 year	Volumes of equipment gathered	
		Stockpiles disposed	+ 2 years	Volumes of equipment disposed	
		Full ban in place	+ 2 years		
PCB in fluorescent light ballasts	Phase out and ban NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Ballasts gathered and stockpiled	+ 2 years	Volumes of equipment gathered	
		Stockpiles disposed	+ 3 years	Volumes of equipment disposed	
		Full ban in place	+ 3 years		Cessation of use and equipment containing PCB
PCDD's and PCDF's	Ban substances and processes by NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Full ban in place	+ 1 year		Virtual cessation of generation of PCDD's and PCDF's
DDT pesticide	Restrictive use only by Permit	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Permit system established	+ 1 year	System proclaimed	Highly restricted use of DDT

Table 3.6-2: Timetable for Plan Implementation for Other Pesticides and Related Chemical Substances and Measures of Success (All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
31 Rotterdam Convention Compounds	Phase out and ban NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Product alternatives identified and promoted	+ 1 year	Scope of substitution	
		Stockpiles disposed	+ 2 years	Volumes of materials disposed	
		Full ban in place	+ 2 years		Cessation of 31 Rotterdam Substances
Other Pesticides	Restrictions and Regulated Use NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Product alternatives identified and promoted	+ 2 years	Scope of substitution	
		Stocks disposed	+ 2 years	Volumes of equipment disposed	
		Permitted use only	+ 2 years		Pesticides under Management Process
Related Chemical Substances	Restrictions and Regulated Use NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Stocks gathered and stockpiled	+ 2 years	Volumes of equipment gathered	
		Stockpiles disposed	+ 2.5 years	Volumes of equipment disposed	
		Permitted use only	+ 2 years		Related chemicals under Management Process
Public Awareness Campaign and Training of Users	Major campaign completed NIP start + 2 years	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Campaigns completed	+ 2 years		Results of awareness survey
Ethylene oxide	Restrictive use with only use by Permit	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Permit system established	+ 1 year	Permit system proclaimed	Highly restricted use of EtO

Table 3.6-3: Timetable for Plan Implementation for Hazardous Materials and Hazardous Wastes and Measures of Success (All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
Identification system for Hazardous Materials and Wastes	UNGHS system fully adopted NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Haz Mat Officers appointed and trained	+ 0.75 year	Appointed staff complete training	
		Training completed for placarding, labelling and documentation	+ 1.5 years		
		Materials tracking system implemented	+ 2 years	Data based in place and in use	
		Full placard/label system in place	+ 2 years	Survey of transport and storage companies and locations	Materials identification system in place.
System for occupational health and safety	WHMIS and related documentation in full use NIP start + 2 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Labour and Environ. Health officers designated and trained	+ 0.75 year	Appointed staff complete training	
		Full WHMIS system in place in all locations	+ 1.5 years	Survey of places of employment using Haz Mat	
		Workers and employers fully trained in use of WHMIS and worker protection.	+ 2 years	Tabulation of workers having taken appropriate training and/or awareness courses.	Worker protection system in place

Table 3.6-3 (Continued): Timetable for Plan Implementation for Hazardous Materials and Hazardous Wastes and Measures of Success (All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
Asbestos –containing materials	Ban imports and regulate existing installations NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulation proclaimed	
		Existing installations surveyed	+ 2 years	Data base of completed survey	
		Removal of material from high-risk cases	+ 3 years	Permits issued match survey data base	
		Permit system in place	+ 3 years		Highly restrictive use of asbestos products
Government institutional capacity enhancement	Complete institutional arrangements NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		HazMat Control Board and Technical Advisory Board appointed	+ 0.75 year	Appointments formally announced	
		Other staffing completed	+ 0.9 year	Appointments formally announced	
		Govn't staff complete training	+ 1 year	Database of staff with appropriate training	Government component of Haz Mat Management System implemented
Private industry/business institutional capacity enhancement	Complete institutional arrangements NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Training and awareness courses completed	+ 1 year	Database of staff with appropriate training	
		Other staffing completed	+ 1 year		Private business implement Haz Mat Management System

Table 3.6-3 (Continued): Timetable for Plan Implementation for Hazardous Materials and Hazardous Wastes and Measures of Success (All dates relative to start of National Implementation Plan)

Component	Objectives	Targets	Target Dates	Performance Indicators	Milestones
Hazardous wastes	System for receiving and disposing of Haz Waste in place NIP start + 1 year	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Staffing at DSWMC completed	+ 0.75 year	Appointments formally announced	
		Training and awareness courses completed	+ 0.9 year	Database of staff with appropriate training	
		Facility at Fond Cole	+ 1 year	Facility opening formally announced	
		Pesticide Awareness and Household Hazardous Waste Days	+ 1.25 year	Volumes of wastes collected	
		Collect stockpiles of other haz wastes	+ 1.5 years	Volumes of wastes collected	
		Dispose of haz waste stockpiles	+ 2 years	Volumes of wastes disposed	Virtual elimination of old stocks of pesticides and haz mat and system in place to collect haz waste.
Contaminated sites/properties	Remediation of major sites NIP start + 3 years	Legislation and regulations proclaimed	+ 0.5 year	Regulations proclaimed	
		Sites identified and assessed	+ 1 years		
		Sites remediated	+ 2 years		
		Clearance certificates issued	+ 3 years		Major sources of old contamination addressed

3.7 RESOURCE REQUIREMENTS

Projected Costs for Persistent Organic Pollutant Management

To meet the objectives and targets discussed in Section 3.6, a budget has been prepared, as provided in Table 3.7-1. The project implementation horizon has been taken as date of approval plus three years (168 weeks). At that time, the project would then integrate into the various Ministries to form a part of their routine activities.

The key activities are proposed to be:

- Preparation of appropriate legislation and associated regulations. This activity will require time for an international legal consultant (incremental cost) and time for either a local consultant or government staff person (baseline cost) and the services of a legal drafting person in the Ministry of Justice (baseline cost). While the Commonwealth of Dominica is currently reviewing a proposed *Pesticides Control and Toxic Substances Act*, the draft Act does not fully address the management of persistent organic pollutants that are not pesticides, does not provide national legislation to implement the Stockholm Convention and does not provide for future changes to address changes or additions to the Stockholm Convention.

- Administrative changes. This activity will require the appointment (incremental cost) of a staff person within MoAFE, through the relevant department, with specific responsibilities for coordinating the National Implementation Plan (incremental cost), acting as the liaison with the Secretariat of the Stockholm Convention and acting as liaison with the GEF. A staff person within the Ministry of Agriculture, Fisheries and Environment already has responsibilities for Pesticide Control Officer (baseline cost) and a person from within Dominica Solid Waste Management Corporation (baseline cost) would be specifically designated to handle pesticide wastes. Additional staff training has been identified to increase staff capacity and capabilities. This will be accomplished by means of an international consultant (incremental cost), with local time for staff to attend the workshops and workshop logistics cost as baseline cost.

- Infrastructure. This activity includes re-instatement of “Pesticide Week”, with special focus on encouraging good agriculture practice with respect to pesticide use, proper pesticide disposal and proper disposal of used containers. This activity also provides for disposal of two old stocks of pesticides (organochlorine and other pesticides) and disposal of a limited quantity of PCB transformer oil and PCB containing fluorescent light ballasts.

Total cost of the Persistent Organic Pollutant Management Component is estimated as US $482,000, of which US $153,000 is incremental cost and US $329,000 is baseline cost.

Projected Costs for Other Pesticides & Related Chemical Substances and Hazardous Materials Management Component

To meet the objectives and targets discussed in Section 3.6, a budget has been prepared, as provided in Table 3.7-2. This table has been constructed on the basis that activities costed in Table 3.7-1 will proceed and that the activities costed in Table 3.7-2 are incremental to address the decision by the National Coordinating Committee (meeting of 17 January 2006) to extend the National Implementation Plan from addressing only Persistent Organic Pollutants to also addressing Other Pesticides and Related Chemical Substances and Hazardous Materials and Hazardous Wastes. As outlined above, the project implementation horizon has been taken as date of approval plus three years (52x3 or 168 weeks). At that time, the project will have been fully integrated into the various Ministries and form part of their routine activities. Also the level of staffing of Control Officers may not need to be as proposed for the implementation phase.

The key activities are proposed to be:

- Enhancement of legislation and associated regulations prepared for the Persistent Organic Pollutant management component. This activity will require time for a legal consultant (incremental cost) and time for a government staff person (baseline cost) and the services of a legal drafting person in the Ministry of Legal Affairs (baseline cost). While the Commonwealth of Dominica is currently reviewing a proposed *Pesticides Control and Toxic Substances Act*, the draft Act does not fully address the management of hazardous materials and hazardous wastes, that are not pesticides, does not provide national legislation to implement the Rotterdam Convention, the Basel Convention or the Vienna Convention/Montreal Protocol and does not provide for future changes to address changes or additions to the various Conventions.

    - Additional administrative changes. This activity will require the key appointment (baseline cost) of a staff person to act as Registrar/Executive Director to the new Hazardous Materials and Hazardous Wastes Management Board and to act as chair of the Technical Advisory Committee. A staff person appointed within MoAFE, through the relevant department, with specific responsibilities for coordinating the National Implementation Plan will also act as liaison with the Secretariats of the Basel Convention, the Rotterdam Convention and the Vienna Convention (no additional cost). Two staff persons within MoAFE through the relevant department will be designated, in addition to the current Officer, as Pesticide Control Officers (baseline cost), two staff persons within the Ministry of Trade will be designated as Hazardous Materials Officers (baseline cost). Additional staff training has been identified to increase staff capacity and capabilities. This will be accomplished by means of an international consultant (incremental cost), with local time for staff to attend the workshops and workshop logistics cost as baseline cost.

- Additional Infrastructure. This activity includes hosting a “Household Hazardous Waste Days” each of the Implementation years to encourage reduction of farm and household pesticides stocks (baseline cost), the removal and proper disposal of a wider spectrum of

pesticides and hazardous materials (baseline cost), construction of a small storage and handling building at the Solid Waste Facility (design consultant as incremental cost, construction as baseline cost), disposal of old stocks of pesticides (baseline cost) and assessment and remediation of one or two contaminated sites (half incremental, half baseline cost). Four other key components will be the procurement of WHMIS information (incremental cost), hazardous materials placarding and labelling to meet the United Nations Global Harmonized System of material identification (incremental cost), the setting up of a Hazardous Materials Tracking system (incremental and baseline cost) and the setting up of a Toxic Substances Referral Centre (incremental and baseline).

Total cost of the Other Pesticides & Related Chemical Substances and Hazardous Materials Management Component is estimated as US $1,426,000, of which US $609,000 is incremental cost and US $817,000 is baseline cost.

Summary Totals

The combined Implementation Plan costs are provided in Table 3.7-3.

Total cost is estimated as US $1,908,000, of which US $762,000 is incremental and US $1,146,000 is baseline. The details for the three groupings are:

- Legislative/Regulatory: US $95,000 ($85,000 incremental, $10,000 baseline).
- Administrative: US $860,000 ($127,000 incremental, $733,000 baseline).
- Infrastructure: US $953,000 ($550,000 incremental, $403,000 baseline)

Sources of Funding

As illustrated in Table 3.7-3, the total baseline cost is estimated as US $1,146,000. This represents current Government or private industry/business expenditures for resources (personnel and activities) that would be assigned to the National Implementation Plan and therefore would represent Dominica's contribution to the funding of the National Implementation Plan.

As also illustrated in Table 3.7-3, the incremental cost is estimated as US $762,000. This represents identified expenditures required to successfully complete the NIP in the projected three year horizon, but are "new" staffing expenditures or purchase of materials, goods or resources outside of Dominica.

To meet the "incremental" costs, the Government of Dominica intends to make application to the Canada POP Fund through the United Nations Environmental Programme for funding of US $250,000. This amount will cover all of the incremental costs identified in Table 3.7-1 and the incremental costs identified under the headings of Legislative/Regulatory and Administrative /Training in Table 3.7-2. To meet the remaining incremental costs (US $512,000), the Government of Dominica intends to make application to Global Environment Facility, through the United Nations Environment Programme.

Table 3.7-1: Persistent Organic Pollutants Component Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Contribution				Local Contribution			Totals	Activity
		Person	Cost	Expenses	Activity	Government Staff	Cost	Expenses		Cost
		(person-weeks)			Cost	(person-weeks)				
Legislation and Regulatory	Prepare legislation	2 Consultants	$11	$6	$17	6	$2	$0	$19	
	Prepare regulations	4 Consultants	$22	$12	$34	9	$4	$0	$38	
	Legal drafting tasks					7	$3	$0	$3	$60
Administration	MoAFE through relevant department POP person	52x3x1	$67	$10	$77				$77	
	Min Agric. Pest. Officer					52x3x1	$67	$15	$82	
	Solid Waste Author. Haz. Waste					52x3x1	$67	$20	$87	
	Staff training	3 trainers	$17	$8	$25	3x30	$36	$5	$66	$312
Infrastructure	Pesticide Week							$5x3	$15	
	Disposal of old pesticide stocks							$45	$45	
	Disposal of old PCB stocks							$50	$50	$110
TOTAL					**$153**					**$482**

Table 3.7-2: Other Pesticides & Related Chemical Substances and Hazardous Materials & Hazardous Wastes Component Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Component				Local Contribution			Totals	Activity
		Person	Cost	Expenses	Activity	Government Staff	Cost	Expenses		Cost
		(person-weeks)			Cost	(person-weeks)				
Legislation and Regulatory	Prepare legislation	2 Consultants	$11	$6	$17	2	$1	$0	$18	
	Prepare regulations	2 Consultants	$11	$6	$17	3	$1	$0	$18	
	Legal drafting tasks					3	$1	$0	$1	$37
Administration	Min Trade Haz Mat Officer (2)					52x3x2	$134	$50	$184	
	Min Agric. Pest. Officer (2)					52x3x2	$134	$50	$184	
	Haz Mat Control Board Ex. Sect.					52x3x1	$84	$30	$114	
	Staff training	3 Trainers	$17	$8	$25	3x30	$36	$5	$66	$548

Table 3.7-2 (Continued): Other Pesticides & Related Chemical Substances and Hazardous Materials & Hazardous Wastes Component Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Component				Local Contribution			Totals	Activity
		Person	Cost	Expenses	Activity	Government Staff	Cost	Expenses		Cost
		(person-weeks)			Cost	(person-weeks)				
Infrastructure	Solid Waste Storage Facility	3 design consultants	$17	$8				$50	$75	
	Haz Mat tracking system	3 Consultants	$17	$158		52x3x1	$49		$224	
	Haz Mat Placards and Labels			$30					$30	
	WHMIS components			$30					$30	
	Household Haz Waste Day							$30	$30	
	Two contaminated site remediations			$140				$40	$180	
	Disposal of old pesticide stocks							$75	$75	
	Pesticide Lab upgrade			$100					$100	
	Toxic Substances Referral Centre			$50		52x3x1	$49		$99	$843
TOTAL					**$609**					**$1,428**

Table 3.7-3: Total Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Component				Local Contribution			Totals	Activity
		Person	Cost	Expenses	Activity	Government Staff	Cost	Expenses		Cost
		(person-weeks)			Cost	(person-weeks)				
Legislation and Regulatory	Prepare legislation	4 Consultants	$22	$11	$34	8	$3	$0	$37	
	Prepare regulations	6 Consultants	$34	$17	$50	12	$5	$0	$55	
	Legal drafting tasks					10	$4	$0	$4	$96
Administration	ECU POP person	52x3x1	$67	$10	$77				$77	
	Min Trade Haz Mat Officer					52x3x2	$134	$50	$184	
	Min Agric. Pest. Officer					52x3x3	$202	$50	$252	
	Solid Waste Author. Haz. Waste					52x3x1	$67	$20	$87	
	Haz Mat Control Board Ex. Sect.					52x3x1	$84	$30	$114	
	Staff training	6 Consultants	$34	$17	$50	6x30	$72	$10	$132	$846

Table 3.7-3 (Continued): Total Resource Requirements – Projected Costs (all values in 000's US $)

Activity	Sub-activities	Incremental Component				Local Contribution			Totals	Activity
		Person	Cost	Expenses	Activity	Government Staff	Cost	Expenses		Cost
		(person-weeks)			Cost	(person-weeks)				
Infrastructure	Solid Waste Storage Facility	3 Consultants	$17	$8				$50	$75	
	Haz Mat tracking system	3 consultants	$17	$158		52x3x1	$49		$224	
	Haz Mat Placards and Labels			$30					$30	
	WHMIS components			$30					$30	
	Pesticide Week							$15	$15	
	Household Haz Waste Day							$30	$30	
	Two contaminated site remediations			$140				$40	$180	
	Disposal of old pesticide stocks							$120	$120	
	Disposal of old PCB stocks							$50	$50	
	Pesticide Lab upgrade			$100					$100	
	Toxic Substances Call Centre			$50		52x3x1	$49		$99	$953
TOTAL					**$762**					**$1,906**