EMA
environmental
management
authority

2007 ANNUAL REPORT

Mission Statement

The Environmental Management Authority is committed to protecting and conserving the natural environment to enhance the quality of life by promoting:

- *Environmentally responsible behaviour*
- *Development and enforcement of environmental legislation*
- *Encouragement of voluntary compliance*
- *The use of economic and other incentives*

This is to be achieved in an atmosphere of mutual respect, professionalism, accountability, transparency, collaboration and social responsibility.

CHAIRMAN'S MESSAGE

Dr. Allan Bachan
Chairman

During the 2007 reporting period, the Board of Directors of the Environmental Management Authority (EMA) operated under the Chairmanship of Mr. Robert Green. On behalf of the Board of Directors responsible for presenting this 2007 Annual Report, it is my pleasure to impart in this report, the ongoing commitment of the EMA in meeting its mandate of providing for sound environmental management in Trinidad and Tobago.

This 2007 Annual Report highlights in detail, the activities and accomplishments of the Environmental Management Authority (EMA), provides an insight into the effectiveness of co-ordination between the EMA and our sister agencies, as well as, outlines our plans and programmes for 2008.

This year 2007, was filled with many accomplishments and changes as the implementation of the Water Pollution Rules, drafting of the Air Pollution Rules and designation of the Aripo Savannas as an Environmentally Sensitive Area, were pursued.

The implementation of the Water Pollution Rules, as with any legislation, was accompanied by huge sensitisation efforts. A massive public awareness campaign was carried out to educate the public. Our documentary on water pollution, newspaper advertisements, television and radio interviews were especially targeted to persons and enterprises engaged in activity that discharge water pollutants into the environment. Subsequently, the intention is to target industrial, commercial, agricultural and sewerage facilities, as well as, institutions such as hospitals, laboratories and universities. Additionally, cabinet has granted approval for the designation of the Golden Tree Frog and the Ocelot as Environmentally Sensitive Species.

A significant change which occurred within the organisation was the transfer of the National Ozone Unit (which was formed within the EMA in 1999) to the then Ministry of Public Utilities and the Environment. This change however, did not stop the Unit from gaining international recognition, as Trinidad and Tobago was awarded the Montreal Protocol Implementers Award in September. In 2007 the National Ozone Unit

implemented a programme to completely phase out the import of chlorofluorocarbons (CFCs) into the country. As a result, no more CFCs were allowed into the country after December 31st 2007 and this represented a significant achievement for this country.The EMA made great progress with respect to waste management as it completed its third lead remediation project, this time at La Chance Trace in north eastern Trinidad.

While 2007 was the year of controversial CEC applications, the EMA remained dedicated to ensuring relevant Environmental Impact Assessments and Public Consultations were carried out to satisfy decision making at executive level management.

The CEC (Designated Activities) Order was amended under Activity 23 in 2007 such that only quarries larger than 150 acres could be regulated by the EMA. Though this amendment is expected to have implications for the management of quarrying activities, we are determined to control pollution via the Water Pollution Rules which were implemented this year.

The EMA remains steadfast in utilising the most reliable tools available to report on the state of the environment. This report examines the state of several aspects of the environment, specifically within the context of the National Environmental Policy for Trinidad and Tobago, and the role of the EMA in fulfilling its mandate as outlined in the Environmental Management Act Chapter 35:05(EM Act).

As outlined in this report, careful consideration and understanding of environmental trends such as: the rate of infrastructural development, water quality and quantity; air quality; and the implementation and enforcement of laws and policies, help to inform a more holistic approach to achieving environmental sustainability.

While human development was of significant concern this year, the EMA also joined the world in celebrating World Environment Day (WED) which focused on the climate change theme – 'Melting ice – a hot topic'. Adopting such themes and building awareness of these critical global issues, enhances the need for the EMA to invest in strengthening its ties with international bodies, and maintaining and improving its relationships with local and regional stakeholders.

As infrastructural development persists, the EMA recognises that its work is ongoing in providing a delicate balance between development and our environment. Thus, as we pursue the required subsidiary environmental management legislation, we continue to strive to encourage environmentally responsible behaviour and promote a culture of sustainable development in Trinidad and Tobago.

In conclusion, I would like to reiterate the Authority's commitment to environmental management. While finding the correct balance between industrial development and environmental protection is key to achieving sustainable development within our country, this has proven to be no easy task. It requires that our operations and decisions harmonise development with natural resource management, while strengthening linkages with sister agencies so as to foster better coordination and delivery of environmental responsibilities. Of critical importance as well, is a strong and effective technical and legal team, continued dedication and passion from every employee, and support from a well-informed and educated population—a factor that the EMA continues to focus on with increased intensity.

In the following year, the EMA is determined on revamping the agenda for sustainable development, and strengthening its role in building human and intellectual capital to assist in meeting today's demands for effective environmental management and governance.

Dr. Allan Bachan
Chairman
February 2014

About the EMA

The Environmental Management Authority of Trinidad and Tobago was established by the Environmental Management Act Chap 35:05 (EM Act) in 1995 on World Environment Day (June 5th).

The Environmental Management Authority is committed to protecting, restoring and conserving the environment to improve the quality of life by promoting:

- Environmentally responsible development.
- A culture of care for the environment.
- Development and enforcement of environmental legislation.
- Use of economic, financial and other incentives.

This is to be achieved in an atmosphere of mutual respect, professionalism, accountability, transparency, collaboration and social responsibility.

One of the main tasks of the EMA to date has been the development and implementation of a comprehensive and cohesive package of (subsidiary) environmental regulatory legislation in accordance with the requirements of the EM Act. Yet, it should be noted that the role of the EMA goes beyond regulation.

The EMA has been investing resources in improving environmental awareness and education; providing an annual state of the environment report; coordinating environmental management functions performed by persons in Trinidad and Tobago; working with partner agencies, organisations and institutions in the development and implementation of other relevant environmental policies and plans; and lending support to the fulfilment of the country's obligations to a number of regional and international conventions and treaties.

The EMA is responsible for a wide range of activities, a responsibility which has become increasingly important over the last few years given the country's rapidly growing economy. To help guide the organisation's work, a five-year strategic plan, spanning the period 2003 to 2008 was developed, within which five strategic priority areas were identified: Clean Air, Clean Water, Waste Management, Noise Management and Healthy Ecosystems.

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ACRONYMS

AR4	Fourth Assessment Report of the Intergovernmental Panel on Climate Change
As	Arsenic
ASOE	Assessment of the State of the Environment report
ASPT	Average Score Per Taxon
Bbl	Barrels
BMWP	Biological Monitoring Working Party
^{o}C	Degrees Celsius
CCC	Criteria continuous concentration
Cd	Cadmium
CDIAC	Carbon Dioxide Information Analysis Center (of the United States Department of Energy)
CEC	Certificate of Environmental Clearance
CFC	Chlorofluorocarbon
CO_2	Carbon Dioxide
CNIRD	Caribbean Network for Integrated Rural Development
Cr	Chromium
CSO	Central Statistical Office
Cu	Copper
DAPRs	Draft Air Pollution Rules
DHDP	Draft Hillside Development Policy 2006
EIA	Environmental Impact Assessment
EMA	Environmental Management Authority
EMAct	Environmental Management Act Chapter 35:05

ESA	Environmentally Sensitive Area
ESS	Environmentally Sensitive Species
FDSPFD	Final Draft Strategic Plan of the Forestry Division 2005 - 2009
GDP	Gross Domestic Product
GEO	Global Environment Outlook
GEO-4	Fourth Global Environment Outlook
GHG	Greenhouse Gas
GIS	Geographic Information System
GoRTT	Government of the Republic of Trinidad and Tobago
HMI	Heavy Metal Index
IAIA	International Association for Impact Assessment
ICC	International Coastal Clean-up exercise
IDF	Infrastructure Development Fund
IMA	Institute of Marine Affairs
IPCC	Intergovernmental Panel on Climate Change
ISQG	Interim Sediment Quality Guidelines
μGG^{-1}	Micrograms per gram
km	Kilometre
mgd	Million gallons per day
mg/l	Milligrams per litre
ml	Millilitre
NAP	Draft National Action Programme to Combat Land Degradation in Trinidad and Tobago
NATE	No Acute Toxic Effects
NBSAP	National Biodiversity Strategy and Action Plan
NEP	National Environmental Policy

NGO	Non-governmental Organisation
NIAA	No Increase Above Ambient
NPA	National Programme of Action for the Protection of the Coastal and Marine Environment from Land-based Sources of Activity
NSD	No Solid Debris
NWP	National Wetlands Policy 2002
NWRMP	National Water Resource Management Policy 2003
OECD	Organisation for Economic Co-operation and Development
OSHA	Occupational Safety and Health Agency
%	Percent
PADH	Physical Alteration and Destruction of Habitats
Pb	Lead
PFD	1999 Policy of the Forestry Division
pH	Hydrogen ion
POPs	Persistent Organic Pollutants
RAR	Review and Assessment Report
SD	Sustainable Development
SIDS	Small Island Developing State(s)
TCPD	Town and Country Planning Division
T&T	Trinidad and Tobago
TO&G	Total Oil and Grease
TOR	Terms of Reference
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
UAM	Urea Ammonia Melamine

UNEP	United Nations Environment Programme
USEPA	United States Environmental Protection Agency
USEPA WQC	United States Environmental Protection Agency Water Quality Criteria
UWI	University of the West Indies
WASA	Water and Sewerage Authority of Trinidad and Tobago
WED	World Environment Day
WHO	World Health Organisation
WPRs	Water Pollution Rules
WRA	Water Resources Agency
Zn	Zinc

PART A: ASSESMENT OF THE STATE OF THE ENVIRONMENT REPORT 2007

EXECUTIVE SUMMARY

The environment is an essential pillar of economic and social development and consequently environmental sustainability is a key objective of economic development planning[1]

The environmental data and information presented in this 2007 Assessment of the State of the Environment (ASOE) report, suggest that during the course of 2007, the Government of the Republic of Trinidad and Tobago and its related agencies continued efforts to improve environmental management (and thus sustainable development) in Trinidad and Tobago. The status of, and general trends in, many environmental issues (such as rate of infrastructural development; water quality and quantity; air pollution and greenhouse gas emissions) remain relatively unchanged when compared with previous years. While this may indicate that the state of the environment in the country was in general not improving, a number of initiatives were implemented or advanced at the national level, including:

- Implementation of the Water Pollution Rules by the Environmental Management Authority;
- Progress on a few selected issues under the National Environmental Policy[1] – notably those related to the phasing out of the importation of ozone-depleting chlorofluorocarbons, and advancement in the Environmentally Sensitive Areas and Environmentally Sensitive Species Rules.

There are, however, a few challenges which persisted or presented themselves in 2007 *inter alia*:

- The introduction of large industrial projects, such as the aluminium smelter plants, which required that significant emphasis be placed on understanding and carefully balancing the economic, social and environmental benefits of such types of development initiatives;
- From a legislative standpoint, the amendment to the Certificate of Environmental Clearance (CEC) Rules (which excluded quarries of a size less than 150 acres from having to apply for a CEC in order to establish or modify their operations) was

[1] National Environmental Policy for Trinidad and Tobago

significant, and meant a potentially larger number of quarrying activities could now proceed unregulated by the CEC process;

- The problem of flooding highlighted the need for better physical planning in Trinidad and Tobago, and the need to consider and begin implementing preventative measures rather than reactive ones.

Sustained implementation of the initiatives introduced in 2007 is required to achieve the objective of improved environmental conditions in Trinidad and Tobago.

1.0 INTRODUCTION

The year 2007 was replete with environment/sustainable development (SD)-related activities at the global scale. With two (2) major international publications during the course of the year - *the Fourth Global Environment Outlook Report (GEO-4)*[2] *produced by the United Nations Environment Programme (UNEP), and the Fourth Assessment Report (AR4) produced by the Intergovernmental Panel on Climate Change (IPCC)*[3] – as well as a string of other activities and publications at both the global and regional scales, significant prominence was given to the negative impacts of human (anthropogenic) activities on the natural environment as well as some of the measures needed to mitigate and reverse these impacts. Special emphasis in 2007 was placed on the issue of climate change with World Environment Day (WED) dedicated to the theme 'Melting ice – a hot topic'.

Here in Trinidad and Tobago (T&T), the Environmental Management Authority (EMA), the University of the West Indies (UWI), selected government agencies and a number of non-governmental organisations (NGOs) were involved in efforts to help raise national awareness about the important messages identified by these international and regional efforts.

However, amidst the positive steps being taken to raise public awareness and increase public participation in environment/SD issues, it would appear that amongst civic society there seemed to be a sense that industrial growth and economic expansion were being given priority over environmental well-being.

At the forefront of national environmental issues was the controversy surrounding the granting of a Certificate of Environmental Clearance (CEC) for the establishment of an aluminium smelter plant by Alutrint Limited at Union Industrial Estate in La Brea[4](see the general location of the plant in Figure 1.1). Although public protests staged in 2006 against the development of a second aluminium smelter plant by Alcoa (in the Cap-de-Ville/Chatham area in southern Trinidad) were met by a Government of the Republic of

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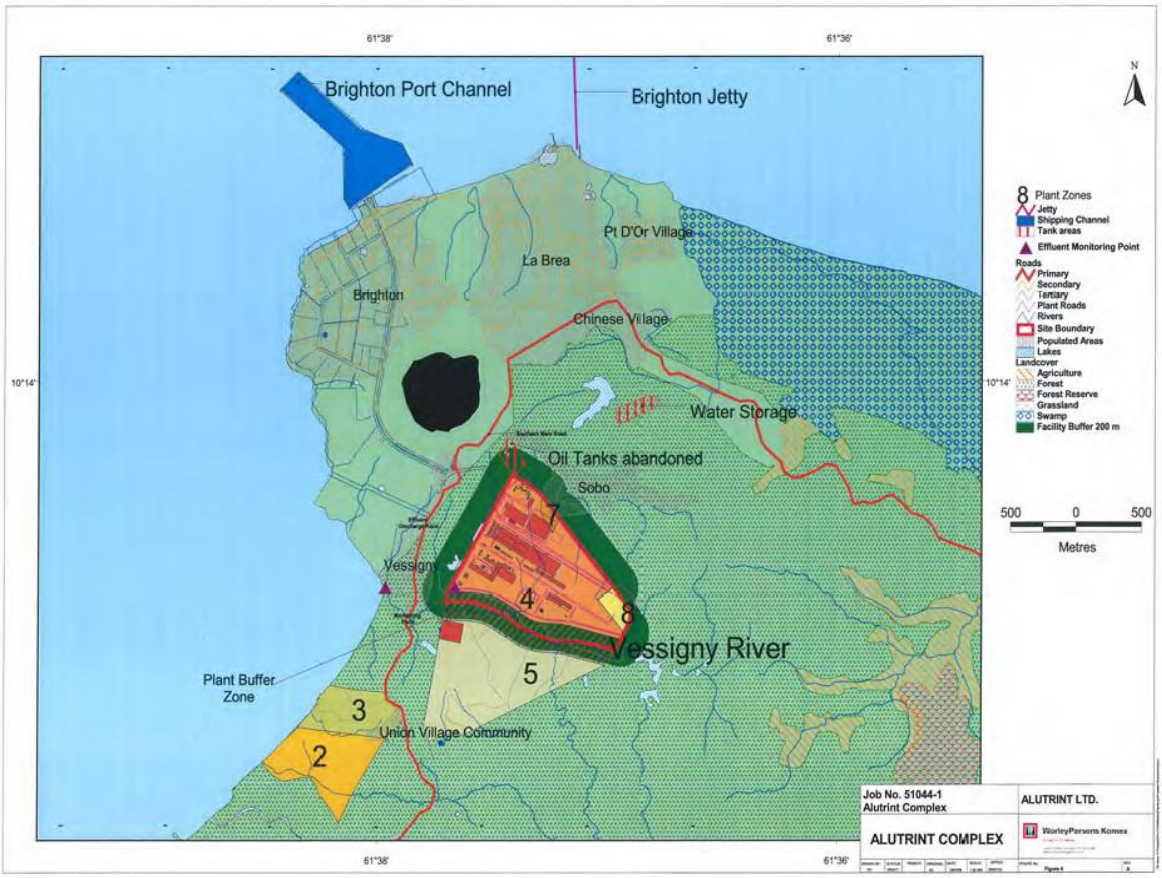
[2] The Global Environment Outlook (GEO) is an integrated environmental assessment process led by UNEP involving hundreds of stakeholders from all sectors of society around the world. For more information on the GEO-4 assessment and report please visit http://www.unep.org/geo/geo4/media/

[3] The IPCC report can be accessed at http://www.ipcc.ch/ipccreports/assessments-reports.htm

[4] See for example http://www.reuters.com/article/companyNewsAndPR/idUSN4325939020070403; http://news.bn.gs/article.php?story=2007091623041675;

Trinidad and Tobago (GoRTT)-led decision in early 2007 to put a halt to Alcoa's plans until a more suitable site was identified[5], there were still mixed reactions about the decision to proceed with the Alutrint project.

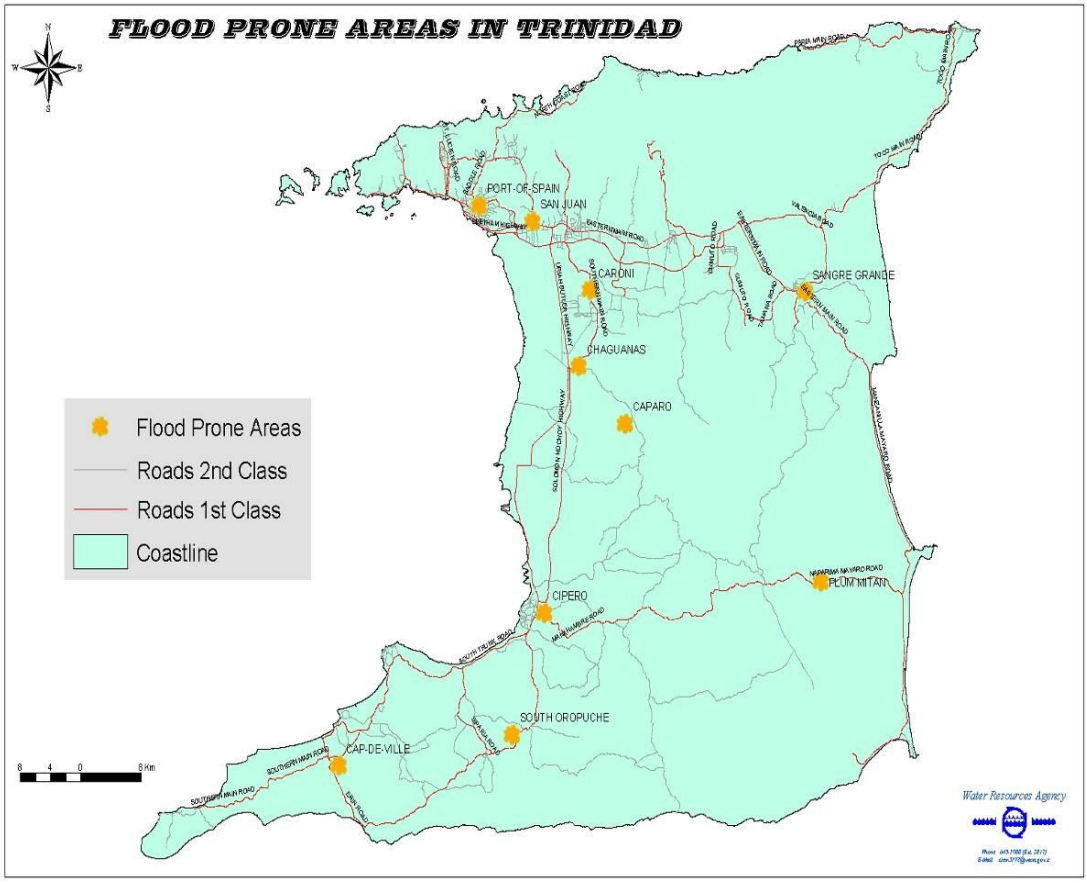


Source: Alutrint GIS 2008

Figure 1.1 Alutrint Complex and surrounding area

[5] See for example http://nosmeltertnt.com/; http://www.bizjournals.com/pittsburgh/stories/2006/12/25/daily8.html; http://ipsnews.net/news.asp?idnews=36070; http://www.redorbit.com/news/science/832384/villagers_in_trinidad_and_tobago_battle_alcoas_plans/index.html

During 2007, the problem of flooding and landslides especially in heavily populated areas also received significant attention. Many residents throughout the country were affected by these environmental disasters[6], and as Figures 1.2 and 1.3 show, the urban areas in low lying regions were those most heavily impacted by flooding events.

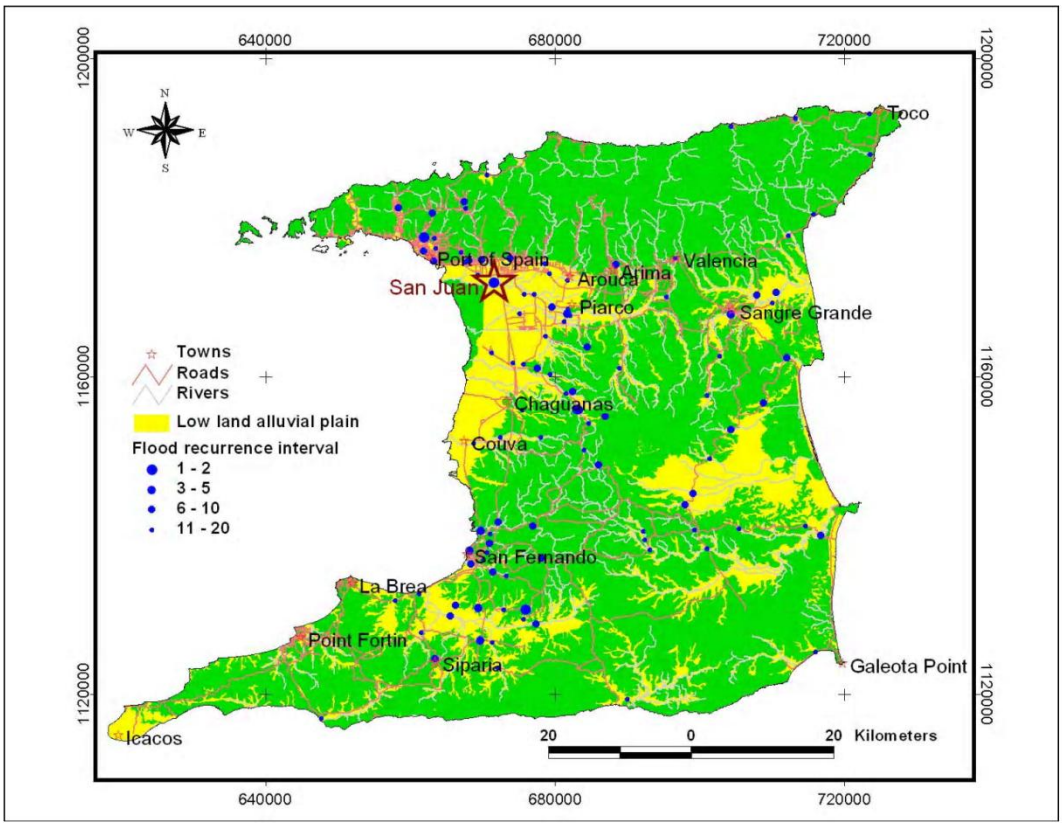


Source: Water Resources Agency 2008

Figure 1.2 Map of Trinidad showing flood prone areas

In an unpublished report emerging from the Department of Surveying and Land Information at UWI (Canisius and Nancy, unpublished), it was found that many flood locations overlap with high density settlement areas, and that such flooding events were associated with high economic losses and damages (Brakenridge, Anderson and Caquard, 2007). Their analysis was based on a 20 year period from 1986-2006.

[6] See for example http://www.cdera.org/cunews/news/trinidad/article_1999.php; http://www.wmo.int/pages/prog/www/tcp/Meetings/HC30/documents/TrinidadandTobago.pdf; http://globalvoicesonline.org/2007/09/03/trinidad-and-tobago-port-of-spain-under-water/; http://www.newsday.co.tt/news/0,63446.html



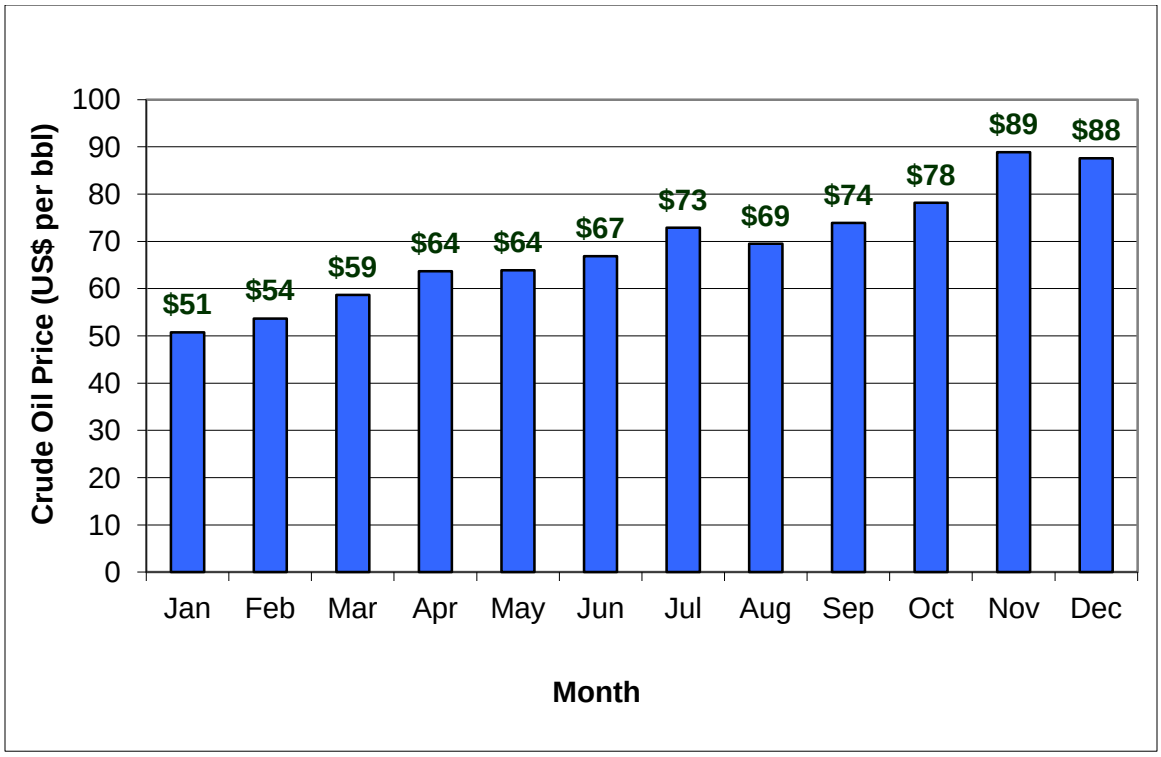
Source: Canisius and Nancy (unpublished)

Figure 1.3 Flood locations in Trinidad based on flood recurrence intervals

Preceding ASOEs have concluded, based on available data and information that the state of the environment in Trinidad and Tobago is progressively deteriorating as a result of human development patterns; and that counteractive measures are not keeping pace with the rate of expansion and development locally.

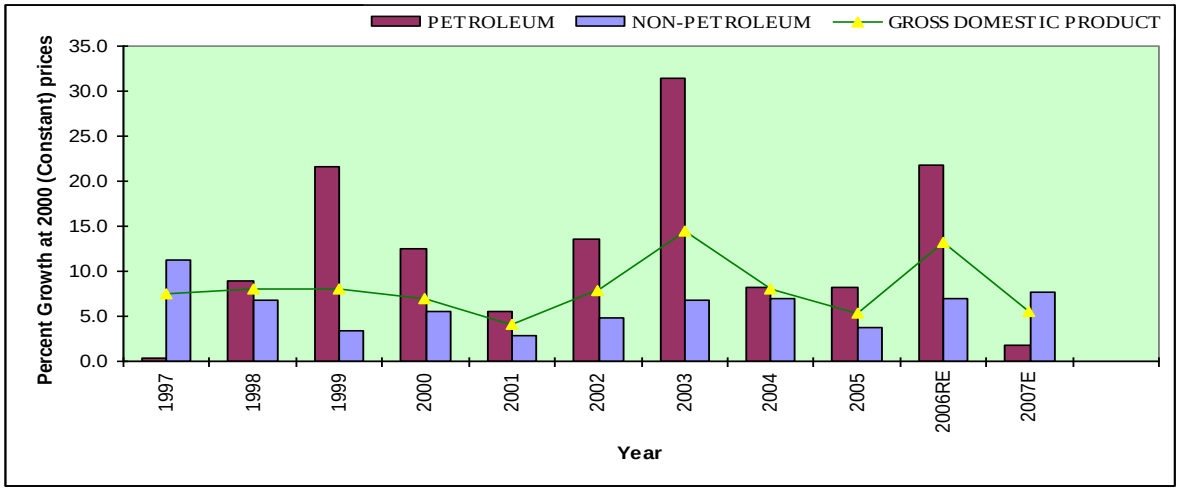
While the price of crude oil increased during 2007, the significant increase occurred in the latter half of the year (see Figure 1.4) thus having little or no impact on the petroleum sector's ability to increase its contribution to the national Gross Domestic Product(GDP[7]) (See Figure 1.5).

[7] In 2007, T&T's Real GDP grew by 5.5%, which was a decrease from the 12.2% rate of growth experienced in 2006. In addition, the statistics also show that there was significant decrease in the contribution of the petroleum sector to national GDP (Central Bank of Trinidad and Tobago 2008).



Source: U.S. Energy Information Administration (April 2010)

Figure 1.4: 2007 global average crude oil prices



Source: Central Statistical Office 2009 (E – estimate; RE – revised estimate).

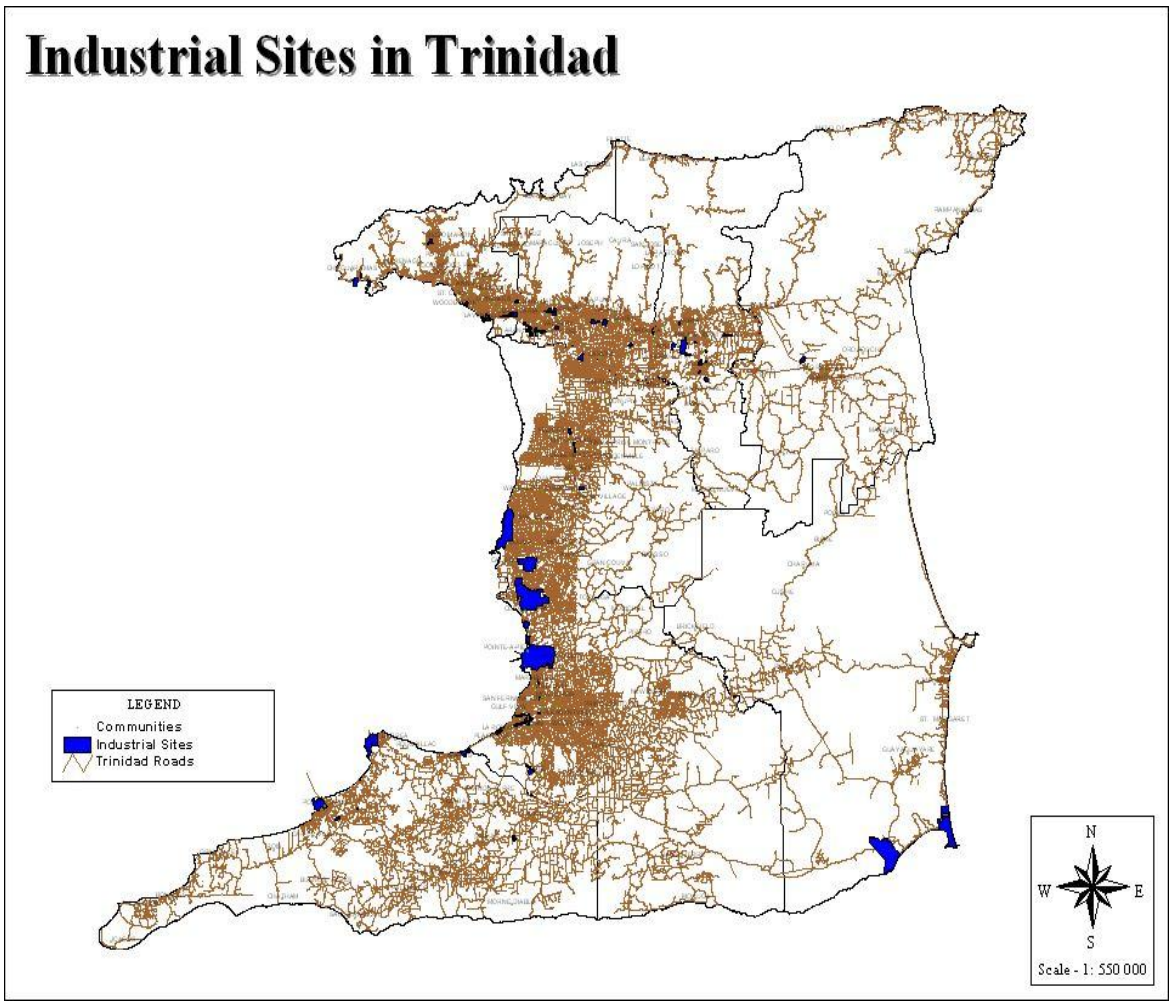
NB: GDP growth calculated at 2000 (constant) prices

Figure 1.5: Contributions from the petroleum and non-petroleum sectors to real GDP growth for Trinidad and Tobago (1997 – 2007)

There was an expansion in industrial sites throughout Trinidad in keeping with the GoRTT's overarching policy that new project proposals in the downstream natural gas sector should include a value added element to create opportunities for downstream businesses. Also, in the 2006/2007 Budget, the Government presented the establishment of new downstream industries to complement the well-established and expanding petrochemical sector. Some of the projects included:

- Alcoa Aluminum Smelter;
- Alutrint Smelter;
- Westlake Ethylene Complex;
- Urea Ammonia Melamine (UAM) Project.

The extent of industrial sites as at 2007 is shown in Figure 1.6 for Trinidad and Figure 1.7 for Tobago.



Source: Town and Country Planning Division, Ministry of Planning, Housing and Environment 2008

Figure 1.6 Map showing industrial sites throughout Trinidad

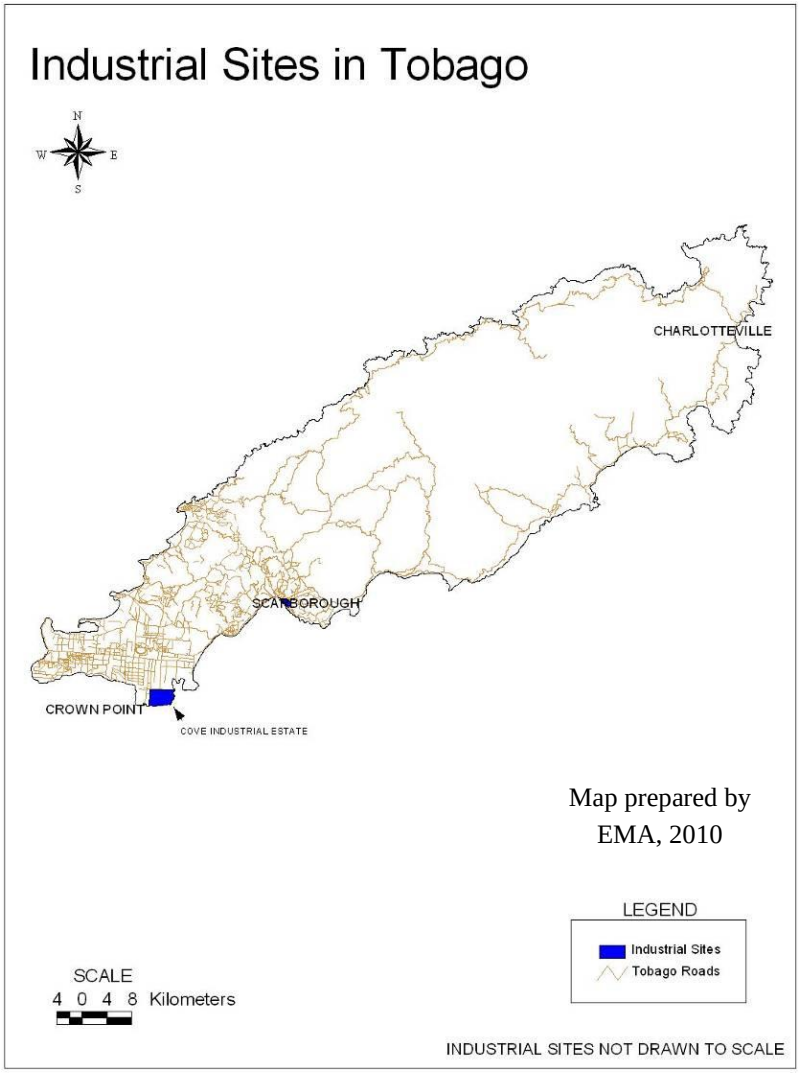


Figure 1.7 Map showing industrial sites throughout Tobago

With the country's sustained economic growth into 2007, and with high levels of infrastructural development, it is important to ensure that adequate measures are put in place to ensure greater environmental sustainability in T&T's planning processes.

In past ASOEs, as well as in a number of other published and/or publicly available documents, the instruments which have been designed to improve environmental

management have been described/listed (see for example the 1999ASOE[8], the 2004 ASOE[9], the website of T&T's Parliament[10]). The current ASOE will not attempt to provide a rehash or update on each instrument. Rather, in order to provide a better understanding of the framework for improving environmental management in T&T, information on two (2) key enabling policies and laws will be included –the National Environmental Policy (NEP), and the Environmental Management Act Chapter 35:05(EM Act), including its subsidiary legislation.

The current ASOE is therefore set out in the following order:

- Chapter 2 focuses on environmental status and trends in T&T as at 2007;
- Chapter 3 focuses on the legal and policy framework for environmental management in Trinidad and Tobago;
- Chapter 4 includes concluding remarks based on the information presented in the current ASOE.

[8] http://www.ema.co.tt/docs/techServ/SOE/1999_SOE.pdf

[9] http://www.ema.co.tt/docs/techServ/SOE/EMA%20SOE%20Report%202004.pdf

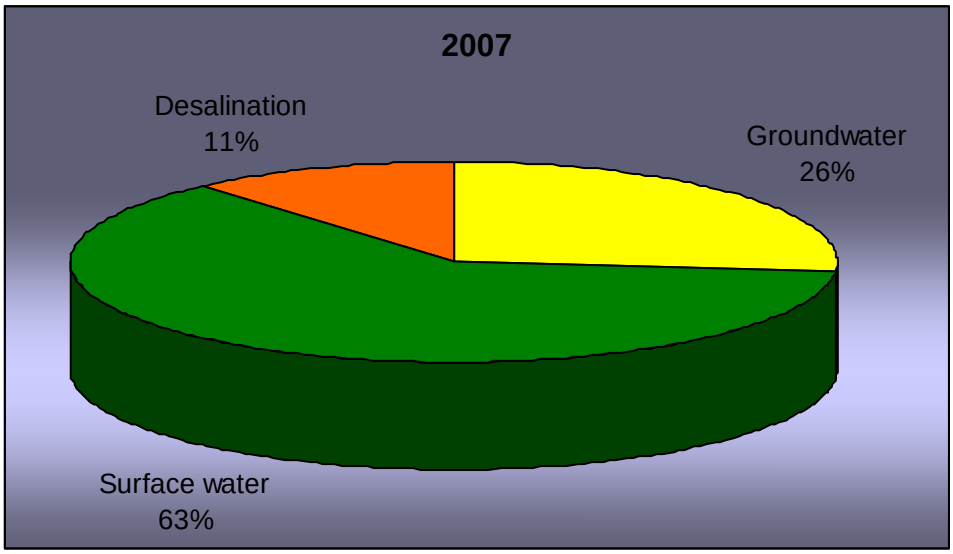
[10] http://www.parliament.gov.tt/legislations/a2005-07.pdf

2.0 ENVIRONMENTAL STATUS AND TRENDS 2007

2.1 Freshwater

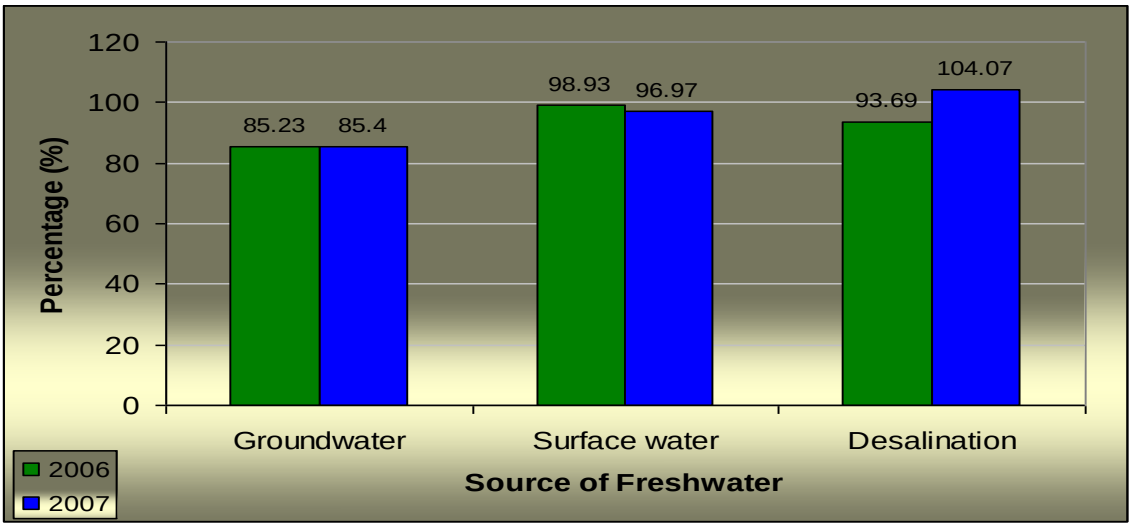
2.1.1 Water Quantity

Data and information from the Water and Sewerage Authority (WASA) of Trinidad and Tobago for 2007 (Figures 2.1 and 2.2) indicate that there was a slightly greater dependence on desalination in 2007 when compared with 2006.



Source: WASA 2008

Figure 2.1 Freshwater abstraction from different sources as a percentage of total abstraction in Trinidad and Tobago (2007)



Source: WASA, 2008

Figure 2.2 Trinidad and Tobago's abstraction of water from sources as a percentage of the water resources agency recommended volumes (2006 and 2007)

Data on different aquifers throughout Trinidad (Table 2.1) indicate that certain aquifer systems, such as the Port of Spain aquifer, were overdrawn and others were very close to their safe yield in 2007. The safe yield of a groundwater basin defines the rate at which water can be withdrawn annually under specific operating conditions without producing an undesired result, some of which include:

- Progressive reduction of the water resource;
- Development of uneconomical pumping conditions;
- Degradation of groundwater quality;
- Land subsidence caused by lowered groundwater levels;
- Interference with prior water rights.

The status of aquifers is thus a cause for concern.

Table 2.1 Status of Trinidad's groundwater aquifers (2007)

Aquifer	Safe Yield/mgd	Production/mgd
Port of Spain	2.5	3.81
Maraval Limestone	0.03	0.11
Maraval Megawatershed	*	4.77
Tucker Valley	4.55	3.83
Chaguaramas Gravels	1.03	0.47
Diego Martin Gravels	8.61	9.08
Santa Cruz	1.96	0.713
El Socorro Gravels	3.44	3.37
La Fillette Alluvials	0.14	0.07
Las Cuevas Bay	*	0.03
Arima Gravels	1.65	0.14
Wallerfield	3.96	1.97
San Souci	*	0.18
Matura Alluvials	*	0.08
Sangre Grande Sands	*	1.17
Valsayn Gravels	6.1	5.55
Tacarigua Gravels	4.15	4.16
Arouca Gravels	1.85	0.61
Mahaica Sands	2.64	2.72
Sum Sum Sands S4	1.65	1.94
Sum Sum Sands S3	2.46	2.36
Sum Sum Sands S5	0.17	0.05
Mayaro Sandstone	0.51	0.33
Goudron Sandstone	1.94	0.51
Guayaguayare	2.6	0.312
LMLE, N of Los Bajos	0.99	0.26
UMLE, N of Los Bajos	0.89	0.94
Erin Sands, S of Los Bajos	7.46	3.23
Erin Sands, N of Los Bajos	1.62	0.85

Source: Water and Sewerage Authority 2008 (mgd = million gallons per day)

2.1.2 Water Quality

As at 2007, a systematic and continuous water quality monitoring programme had not been implemented in Trinidad and Tobago. However, the following studies have been done to examine certain aspects of water quality in T&T.

Heavy Metal Concentrations in Water and Sediments in Rivers across Trinidad and Tobago (Surujdeo-Maharaj, Alkins-Koo and Chang-Yen, 2007)

A report commissioned by the EMA and published in 2007 presented an overview of the concentrations of selected physicochemical parameters and heavy metals (Table 2.2) in the water and sediment at 67 sites along 40 rivers across Trinidad and Tobago (Figure 2.3). Sampling was done during both dry and wet seasons for the period 1998-2001.

Table 2.2: List of Physicochemical parameters and heavy metals monitored at sites in Trinidad and Tobago

Physicochemical Parameters/Substances (Units)	Heavy Metals (Units)
Temperature (°C)	Copper (mg/L)
Dissolved Oxygen (mg/L)	Nickel (mg/L)
Five Day Biological Demand (mg/L)	Cadmium (mg/L)
pH (pH Units)	Zinc (mg/L)
Alkalinity (mg/L)	Chromium (mg/L)
Total Hardness (mg/L)	Lead (mg/L)
Conductivity (µS)	
Total Suspended Solids (mg/L)	
Total Dissolved Solids (mg/L)	
Nitrate-N (mg/L)	
Total Phosphates (mg/L)	

Source: Surujdeo-Maharaj, Alkins-Koo & Chang-Yen, 2007

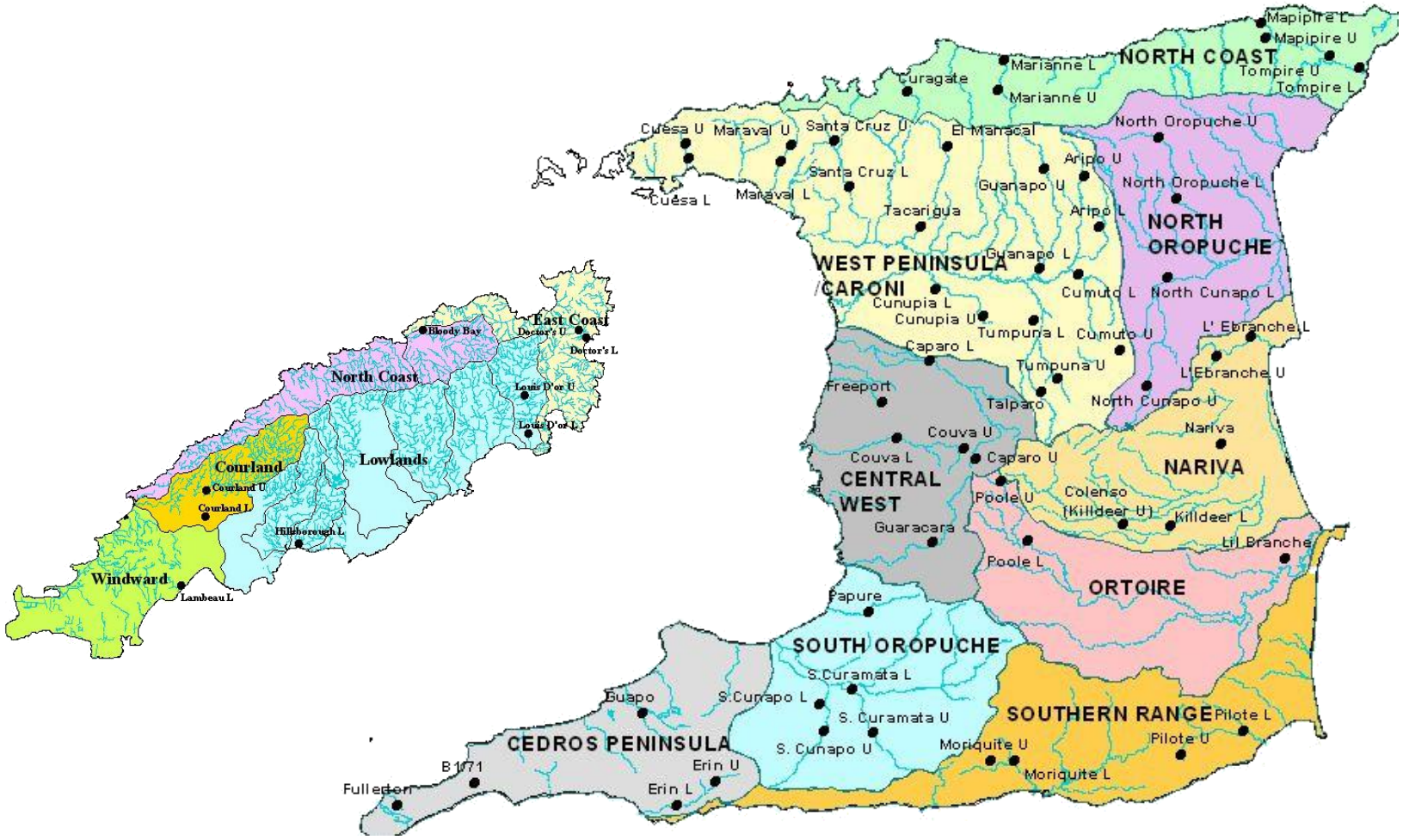


Figure 2.3 Map of sampling sites for heavy metal survey in Trinidad and Tobago (not to scale)

For each season, individual heavy metal concentrations in the water at each monitored site were compared against the United States Environmental Protection Agency (USEPA) National Recommended Water Quality Criteria (Corrected) (USEPA WQC) (USEPA, 2002). The USEPA's levels for Criteria Continuous Concentration (CCC) which is the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect, was used in this study, as it considers long-term exposure to the metals in question (Table 2.3).

TABLE 2.3: USEPA national recommended water quality criteria for heavy metals (corrected) (2002)

Heavy Metal	Criteria Continuous Concentration (mg/L)
Cadmium	0.0022
Chromium III	0.074
Chromium VI	0.011
Lead	0.0025
Copper	0.0090
Nickel	0.052
Zinc	0.120

Source: Surujdeo-Maharaj, Alkins-Koo & Chang-Yen 2007

The concentrations of each individual heavy metal in the sediment collected were compared against the Interim Sediment Quality Guidelines (ISQG) of the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (Table 2.4) (Canadian Council of Ministers of the Environment, 1999).

Table 2.4: Interim Sediment Quality Guidelines (ISQG) of the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (1999)

Heavy Metal	ISQG ($\mu g g^{-1}$)
Cadmium	0.6
Chromium	37.3
Lead	35.0
Copper	35.7
Mercury	0.17
Zinc	123

Source: Surujdeo-Maharaj, Alkins-Koo & Chang-Yen 2007

The comparisons of the concentration of each individual heavy metal in water against the selected criterion are presented in Figures 2.4-2.9. The results indicate that metals of concern with respect to water are: lead (Pb), zinc (Zn), copper (Cu)and chromium (Cr). Generally, average concentrations of nickel (Ni), Zn and Pb were higher in the wet season. Occurrence of Cu, Ni and Cr above their respective criteria was greater in the wet season while CadmiumCd was more prevalent in the dry. Zn and Pb had high prevalence above the criteria for both seasons.

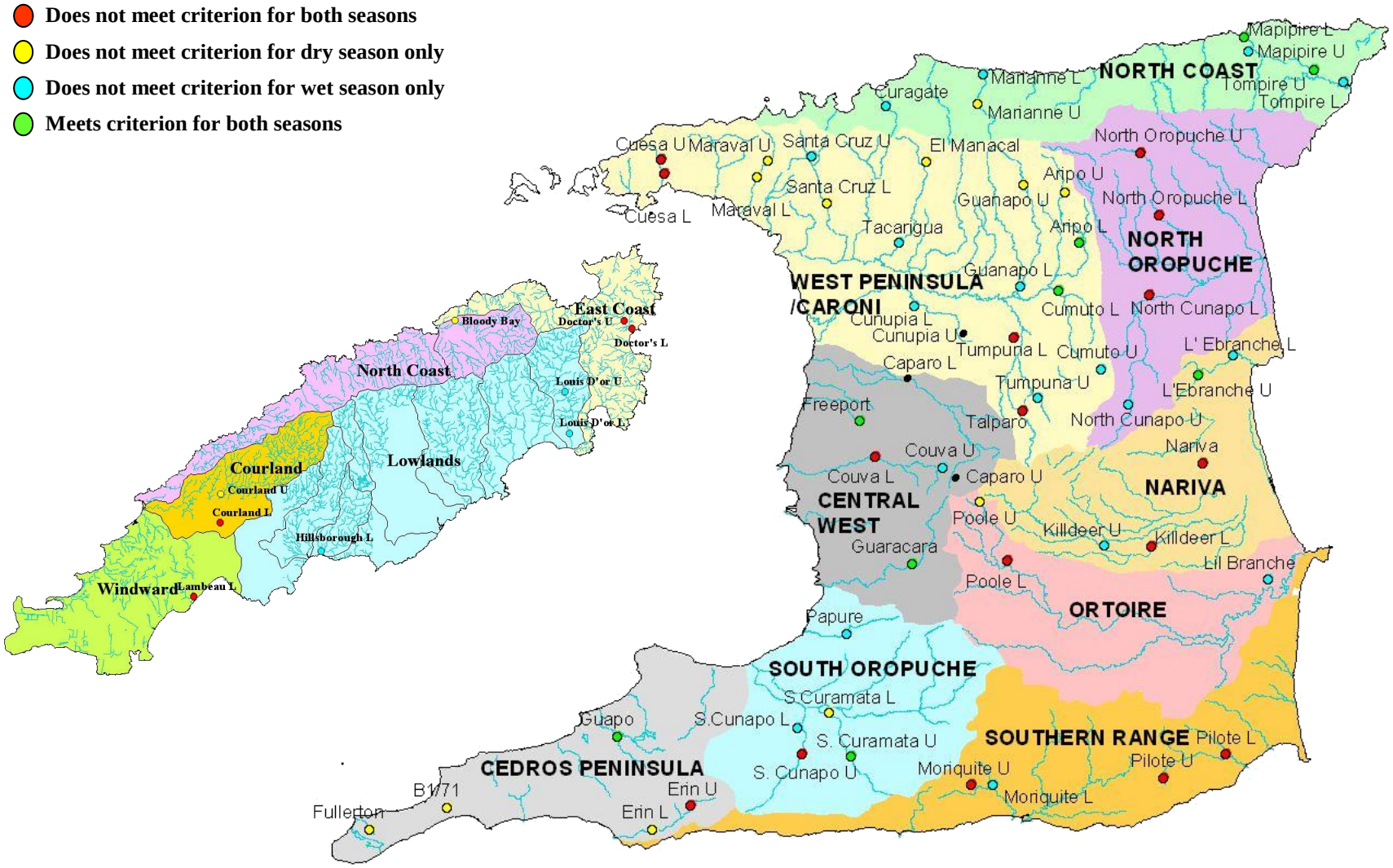


Figure 2.4: Map showing results for copper in water of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to USEPA Water Quality Criteria (2002)

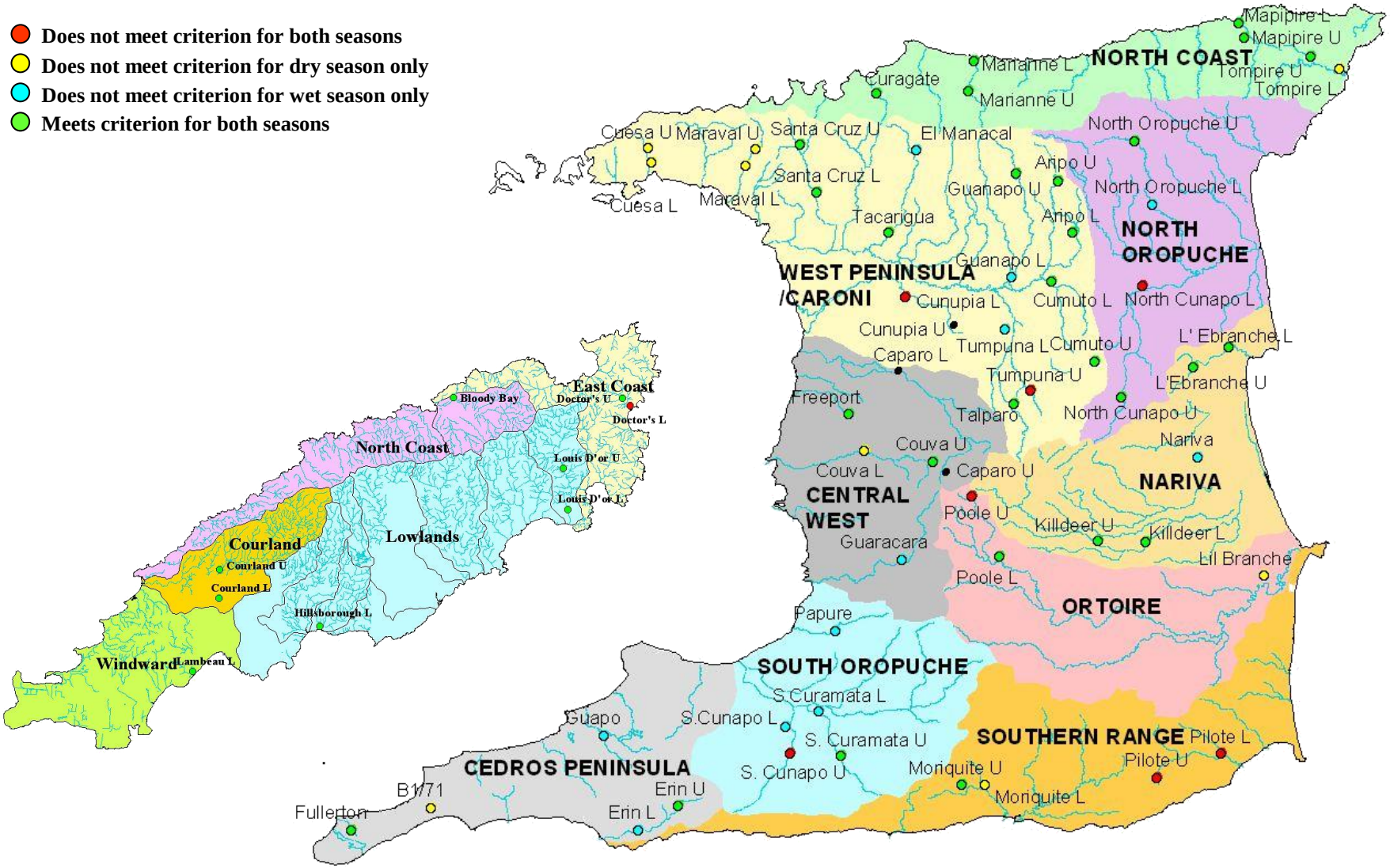


Figure 2.5: Map showing results for nickel in water of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to USEPA Water Quality Criteria (2002)

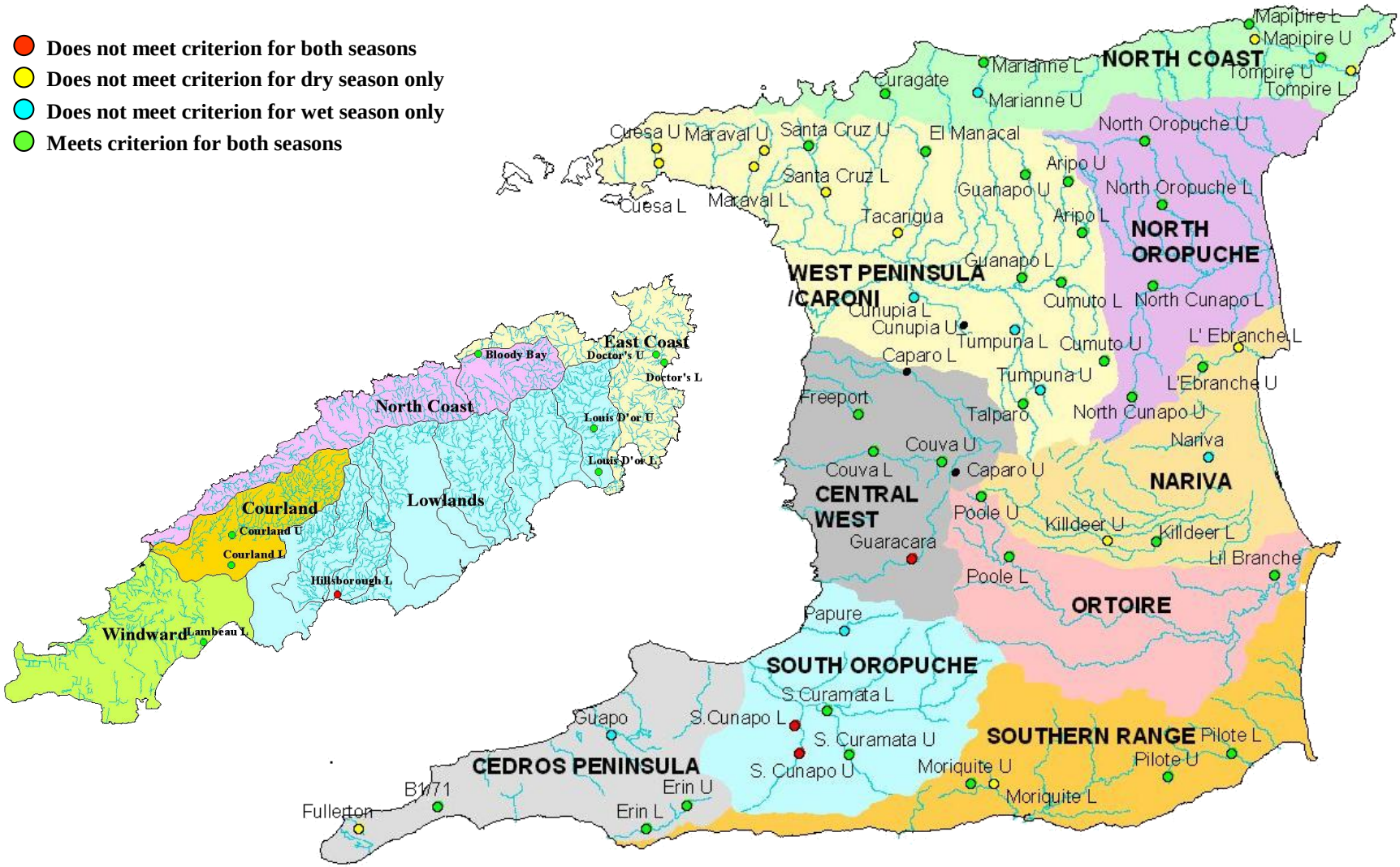


Figure 2.6: Map showing results for cadmium in water of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to USEPA water quality criteria (2002)

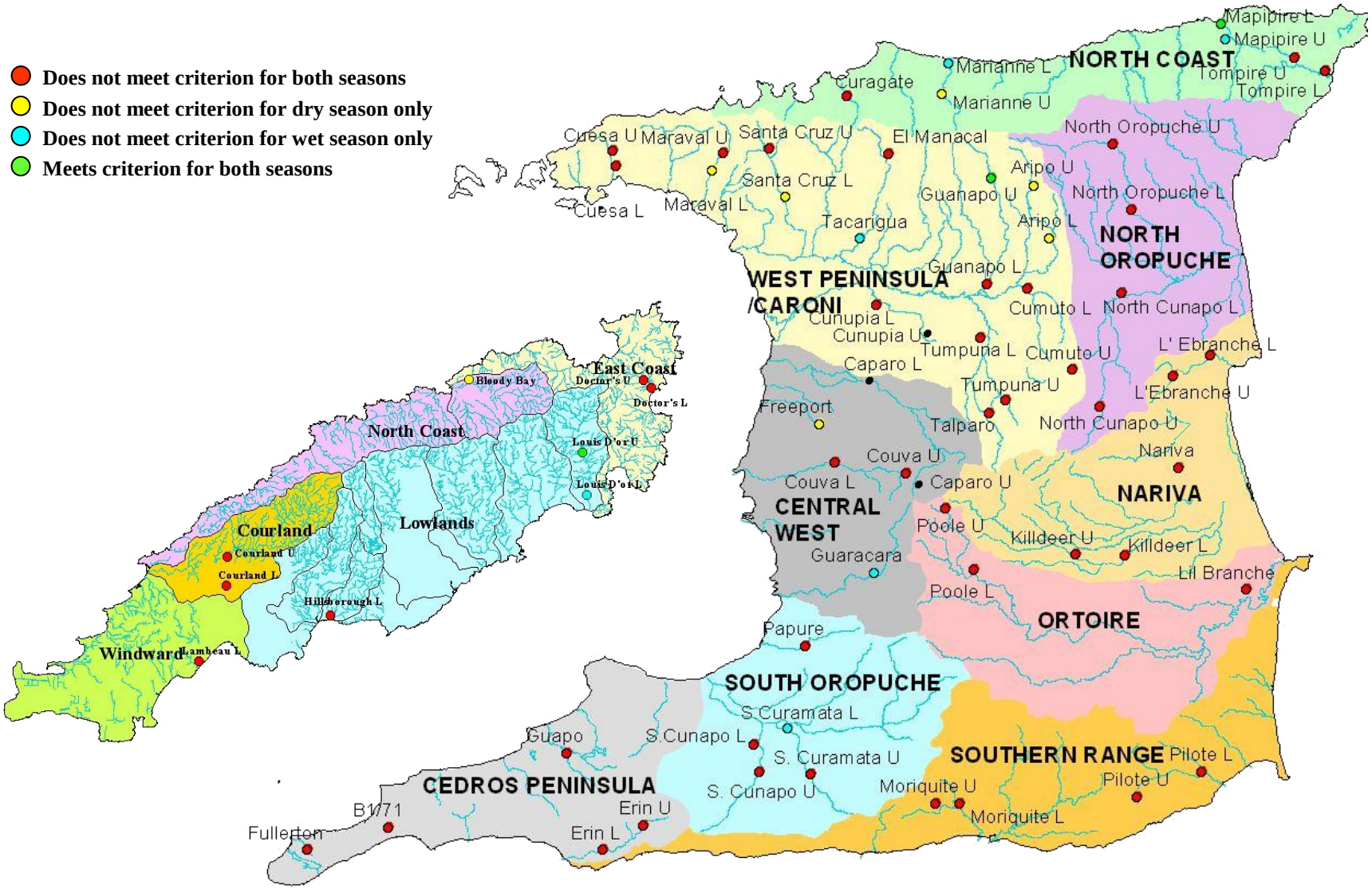


Figure 2.7: Map showing results for zinc in water of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to USEPA water quality criteria (2002)

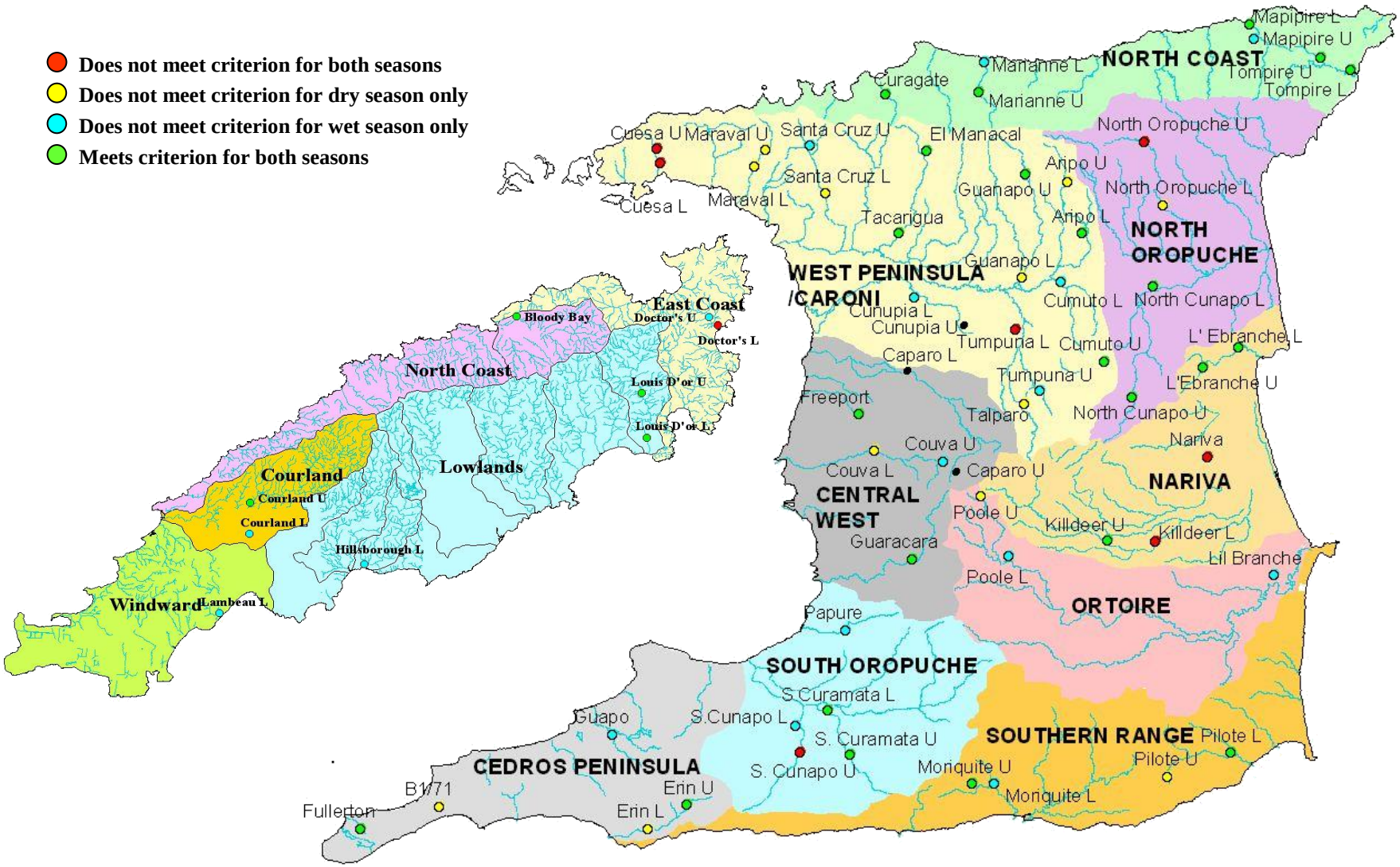


Figure 2.8: Map showing results for chromium in water of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to USEPA water quality criteria (2002)

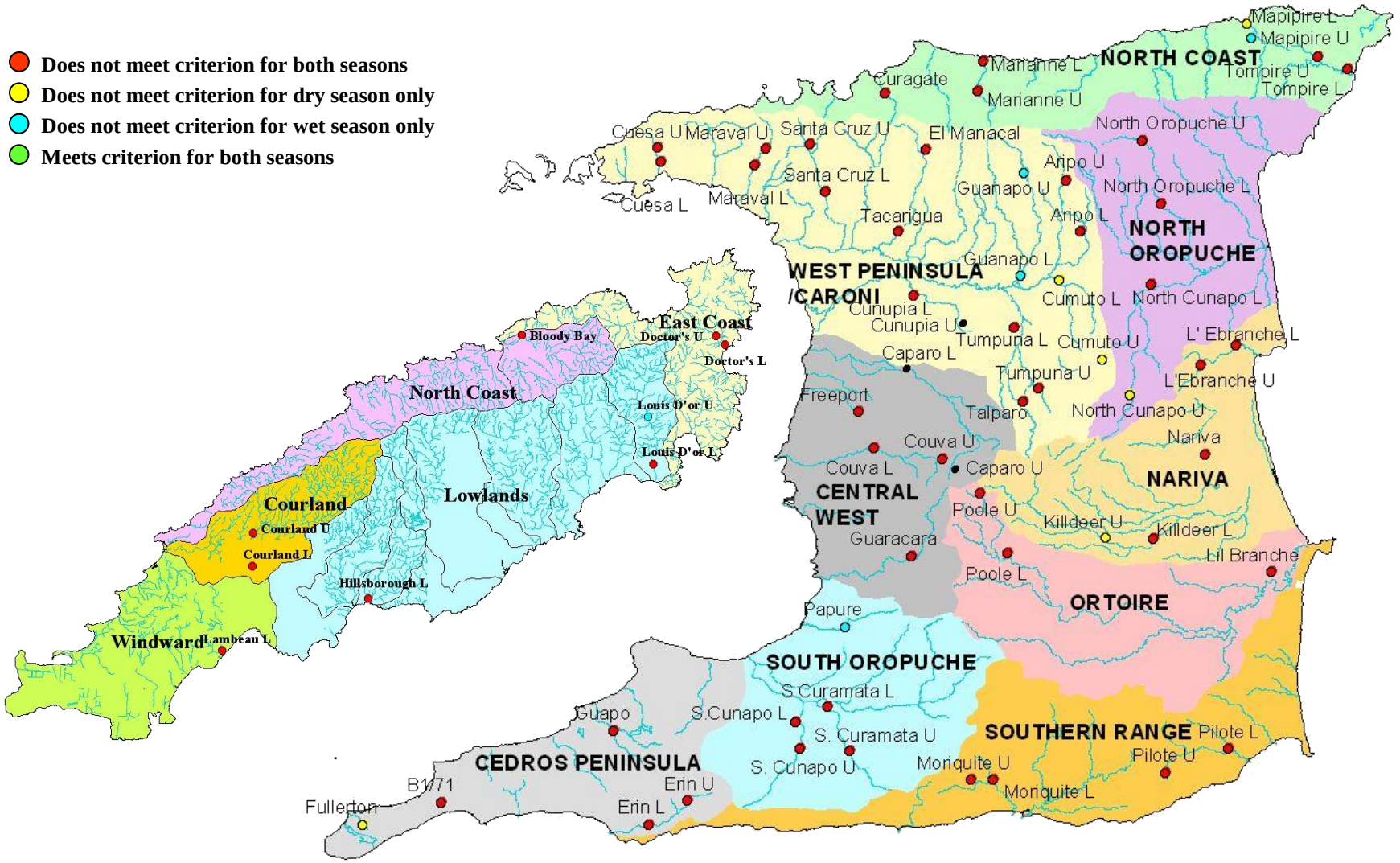


Figure 2.9: map showing results for lead in water of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to USEPA Water Quality Criteria (2002)

Based on the results obtained for each individual heavy metal concentration, a heavy metal index (HMI) for water and sediment was developed and calculated for each of the sites investigated. Sites were then classified as pristine, perturbed or polluted based on the value of the HMI. Results of the HMI calculated for water show that most of the sites in both islands were categorized as perturbed, with none recognised as pristine. North Trinidad had the highest percentage of polluted sites followed by central and south Trinidad (Figure 2.10).

Based on proportion of sites where metal concentrations in riverine sediments exceeded the relevant standards, the metals of concern locally were identified as being Zn and Pb. Tobago however had a higher prevalence of Cu and Cr. Concentrations of most metals in sediments were higher in the dry season and similarly, prevalence of all metals above the respective criteria was greater in the dry than wet season (Figures 2.11-2.15).

The results of the HMI calculated for riverine sediments in Trinidad and Tobago indicated that six (6)% of all sites sampled were polluted. All sites were in Trinidad and were located in the West Peninsula/Caroni, South Oropouche and Cedros Peninsula hydrometric areas (Figure 2.16). Fifty seven (57)% of all sites sampled were perturbed, including all sites in Tobago and 50% of the Trinidad sites. Thirty seven (37)% of all sites were pristine and were all located in Trinidad.

The study found that the main source of heavy metals at the majority of sites studied was domestic and municipal wastewater (including sewage). Other contributors of heavy metals included natural geologic sources (the major heavy metal source at sites in Tobago) and effluent from industrial activities (responsible for the heavy metal concentrations obtained at Erin and Guaracara rivers).

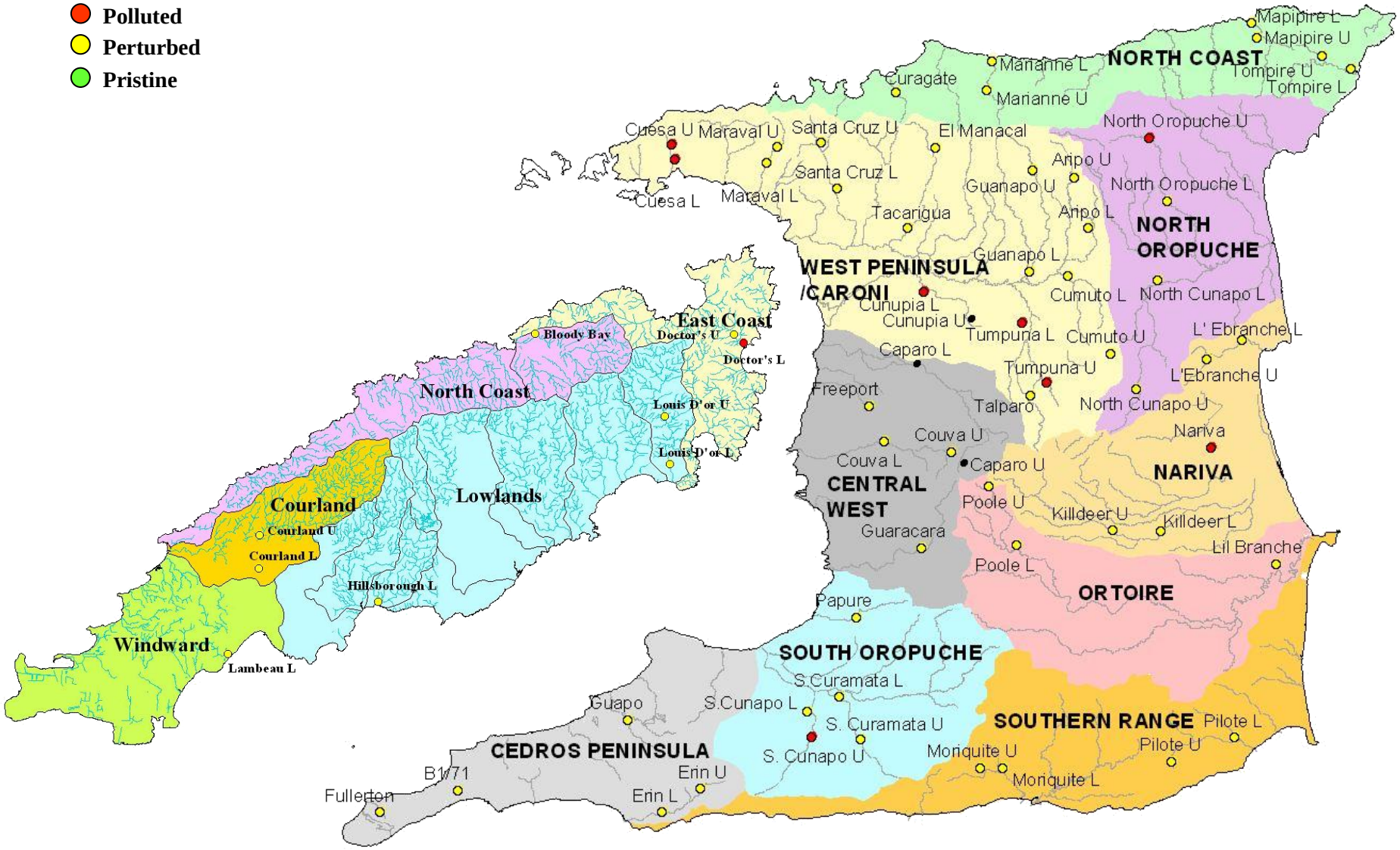


Figure 2.10: Map showing overall heavy metal index for water in rivers of Trinidad and Tobago

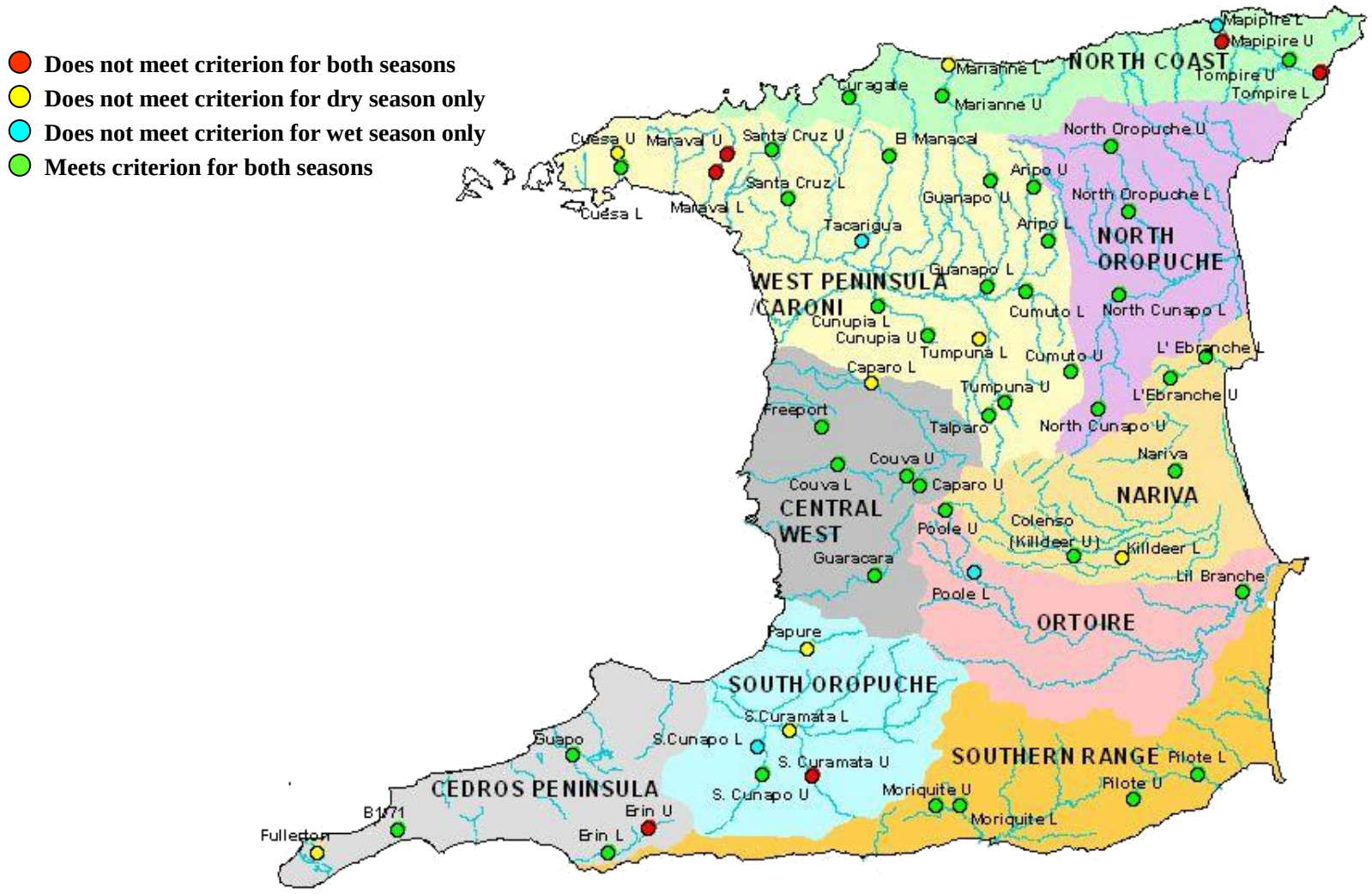


Figure 2.11: Map showing results for copper in sediments of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to Canadian Sediment Quality Guidelines (1999)

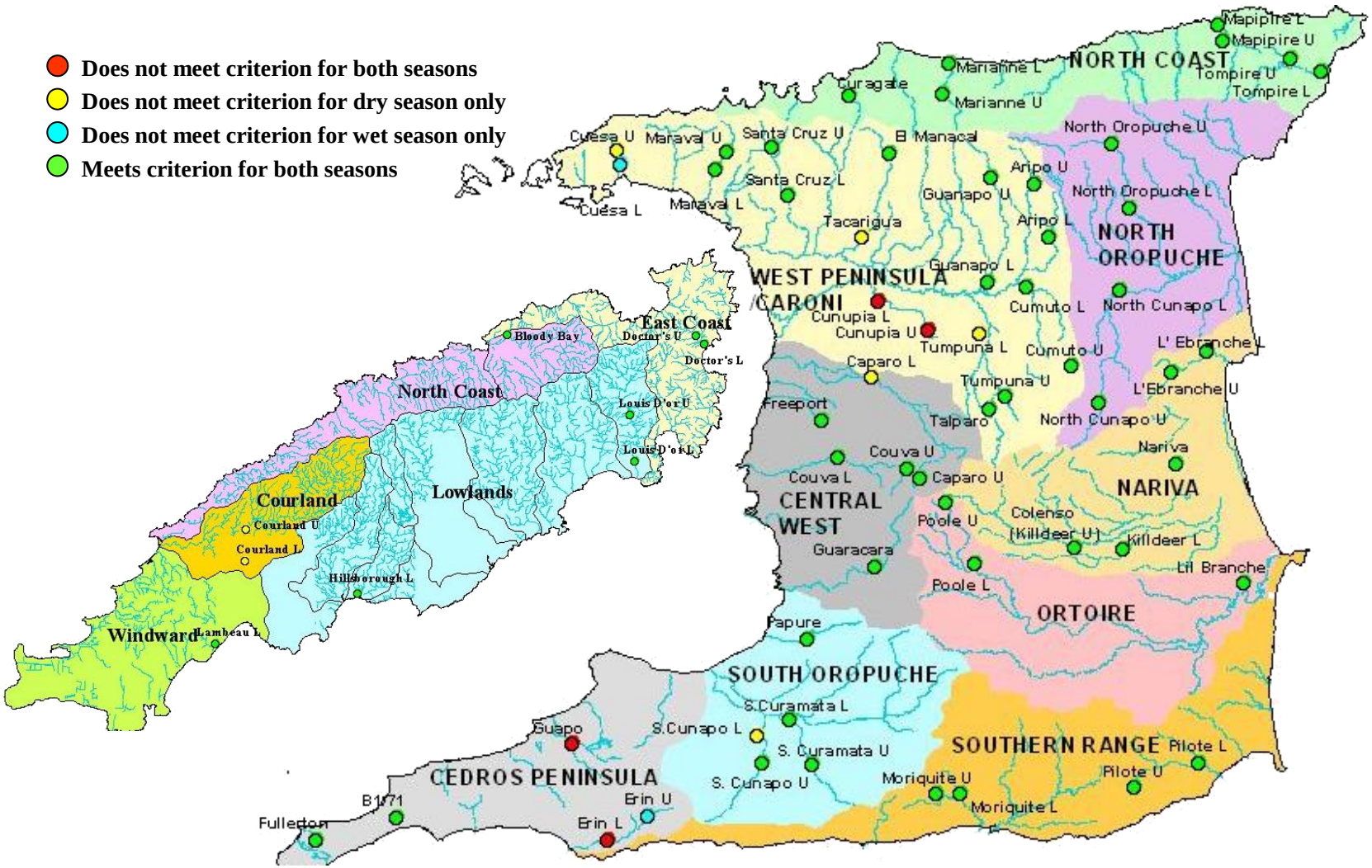


Figure 2.12: Map showing results for cadmium in sediments of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to Canadian Sediment Quality Guidelines (1999)

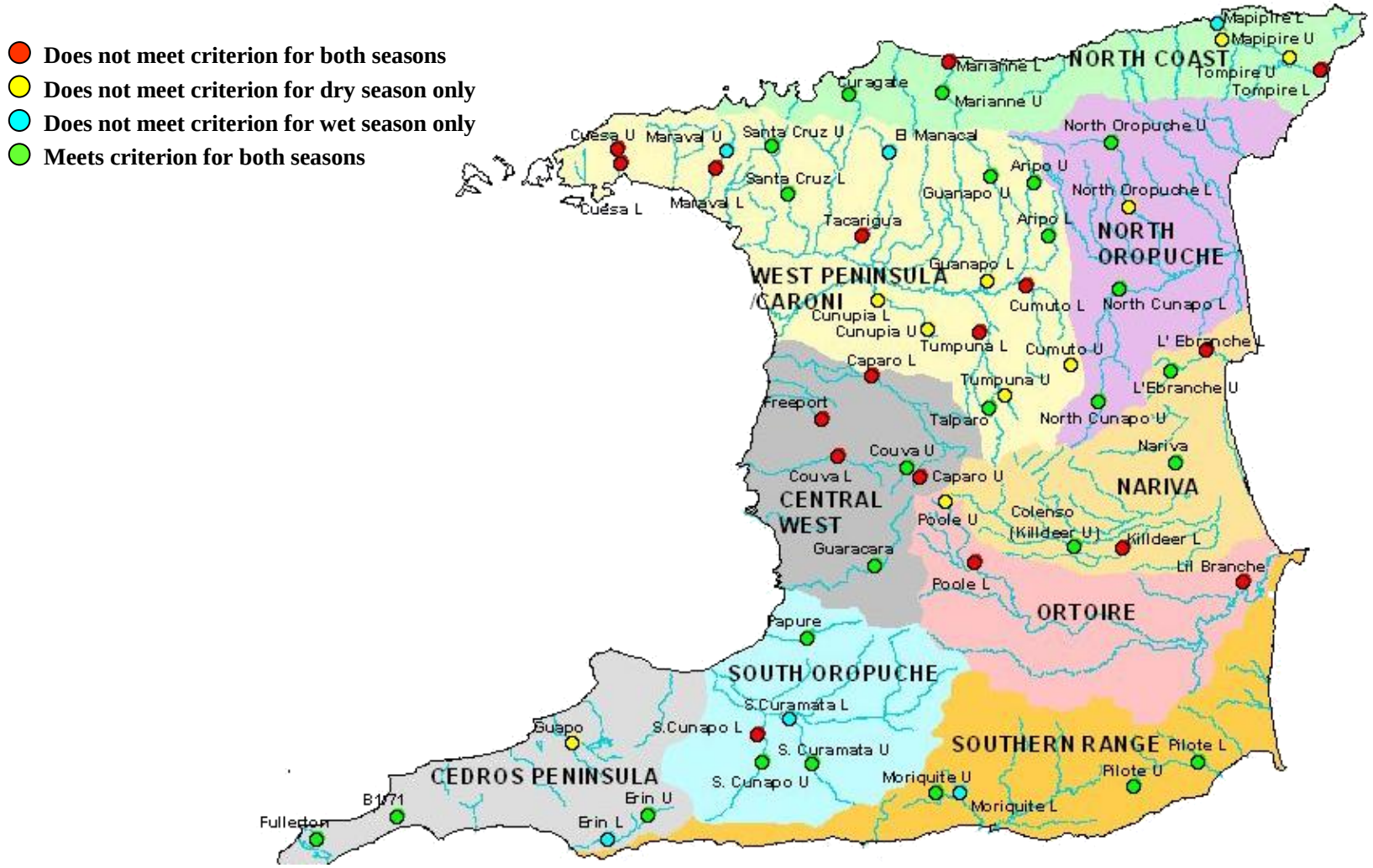


Figure 2.13: Map showing results for zinc in sediments of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to Canadian Sediment Quality Guidelines (1999)

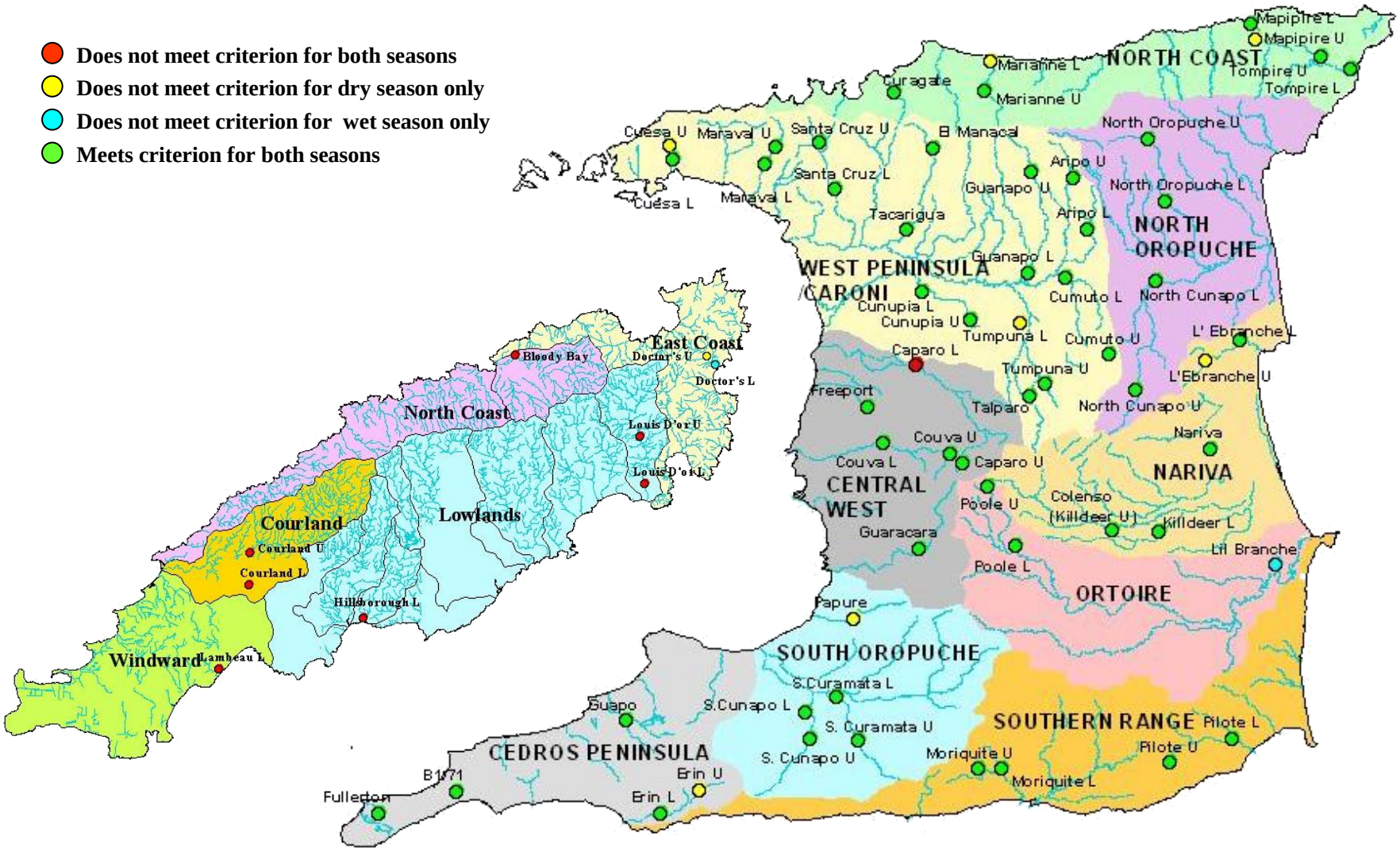


Figure 2.14: Map showing results for chromium in sediments of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to Canadian Sediment Quality Guidelines (1999)

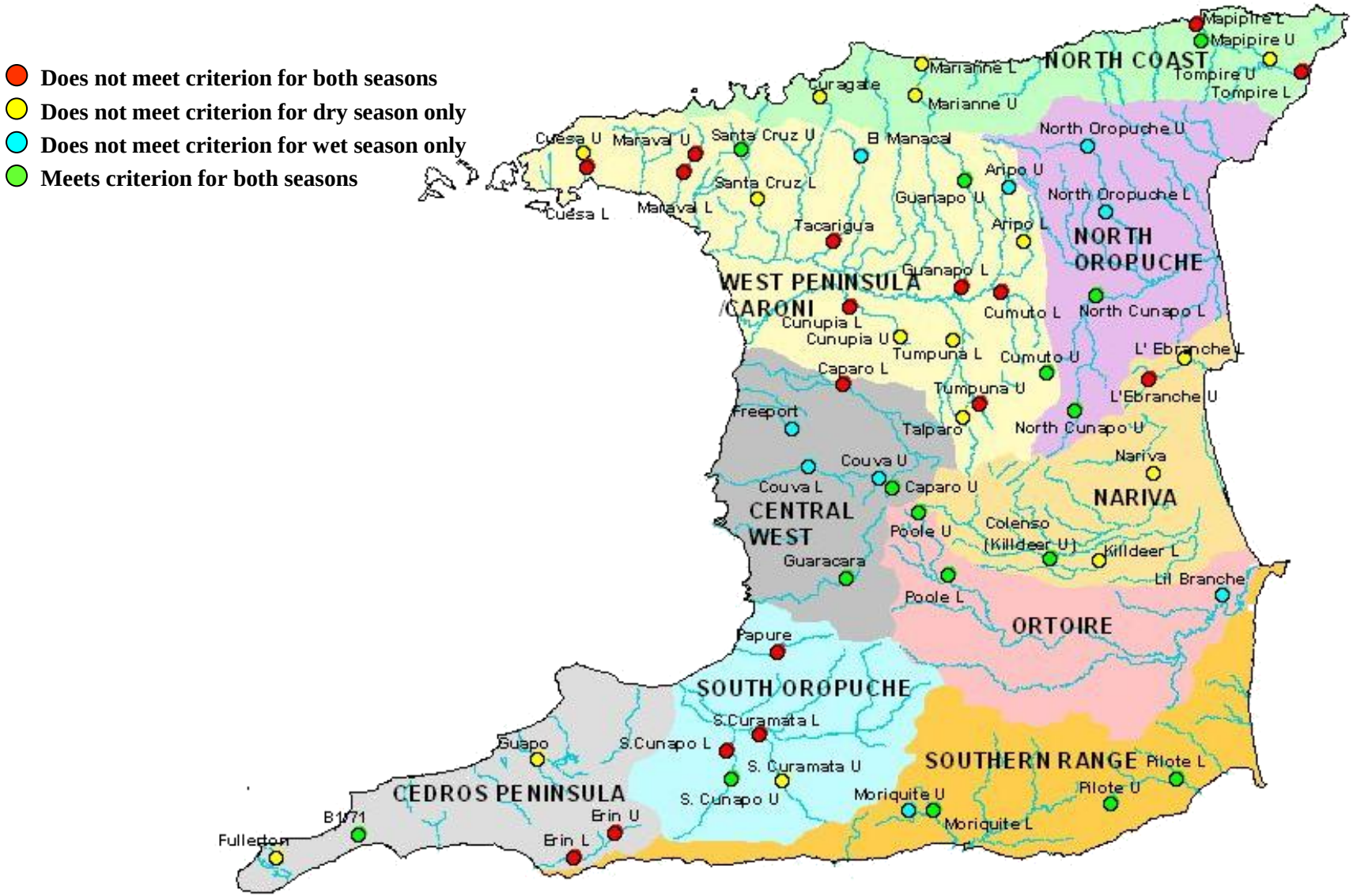


Figure 2.15: Map showing results for lead in sediments of rivers in Trinidad and Tobago (not to scale) – Metal concentration compared to Canadian Sediment Quality Guidelines (1999)

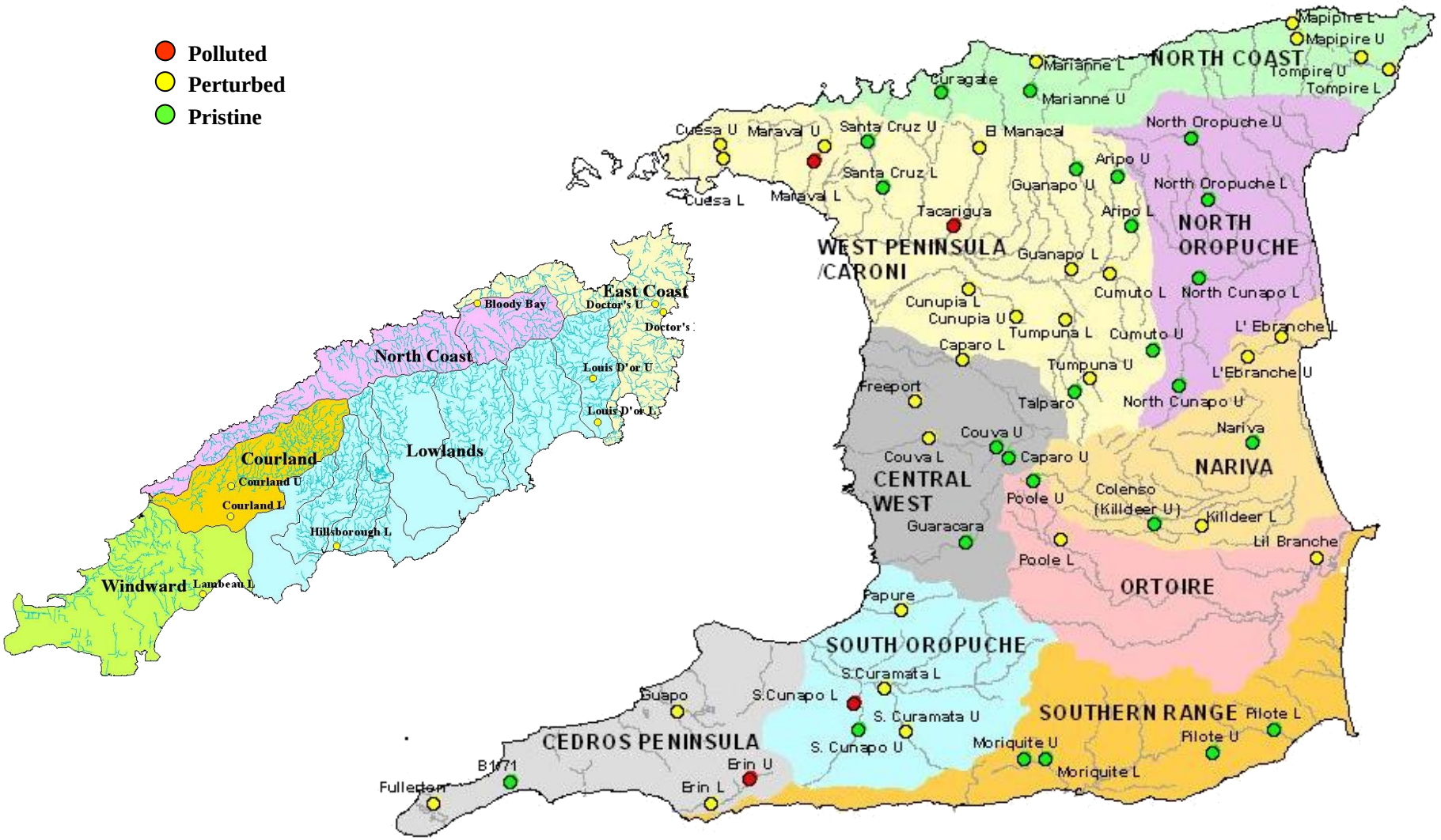


Figure 2.16: Map showing overall heavy metal index for sediments in rivers of Trinidad and Tobago

Use of Benthic Macroinvertebrates to Assess Human Impacts in the Rivers of Trinidad and Tobago (Maharaj and Alkins-Koo, 2007)

A report commissioned by the EMA and published in 2007 assessed river water quality based on the composition and abundance of the benthic macroinvertebrate fauna. The study examined the benthic macroinvertebrate fauna at 63 sites along 38 rivers in Trinidad and Tobago, for both wet and dry seasons during the period 1999-2001 (Figure 2.17). At each site, the degree of habitat impairment (i.e., minimal, moderate and severe) and concentration of several physicochemical parameters/substances were assessed (Table 2.5). In addition, several biological metrics based on taxonomic richness, composition and abundance as well as pollution tolerance were calculated and correlated against the degree of habitat impairment seen at each site.

The study found that the major human impacts on Trinidad and Tobago's rivers varied, with Tobago's rivers being impacted mostly by sedimentation while the major impacts on rivers in north and northeast Trinidad were sedimentation, eutrophication and organic pollution. Rivers in central and south Trinidad were mostly impacted by organic and oil pollution, with salinity being identified as a problem at some sites. Nutrient enrichment was also identified as a widespread problem, with 92% of all sites monitored having high total phosphate levels and 84% having high nitrate levels. These trends were found to be directly related to land conversion and riparian degradation, and are consistent with urbanisation and population growth.

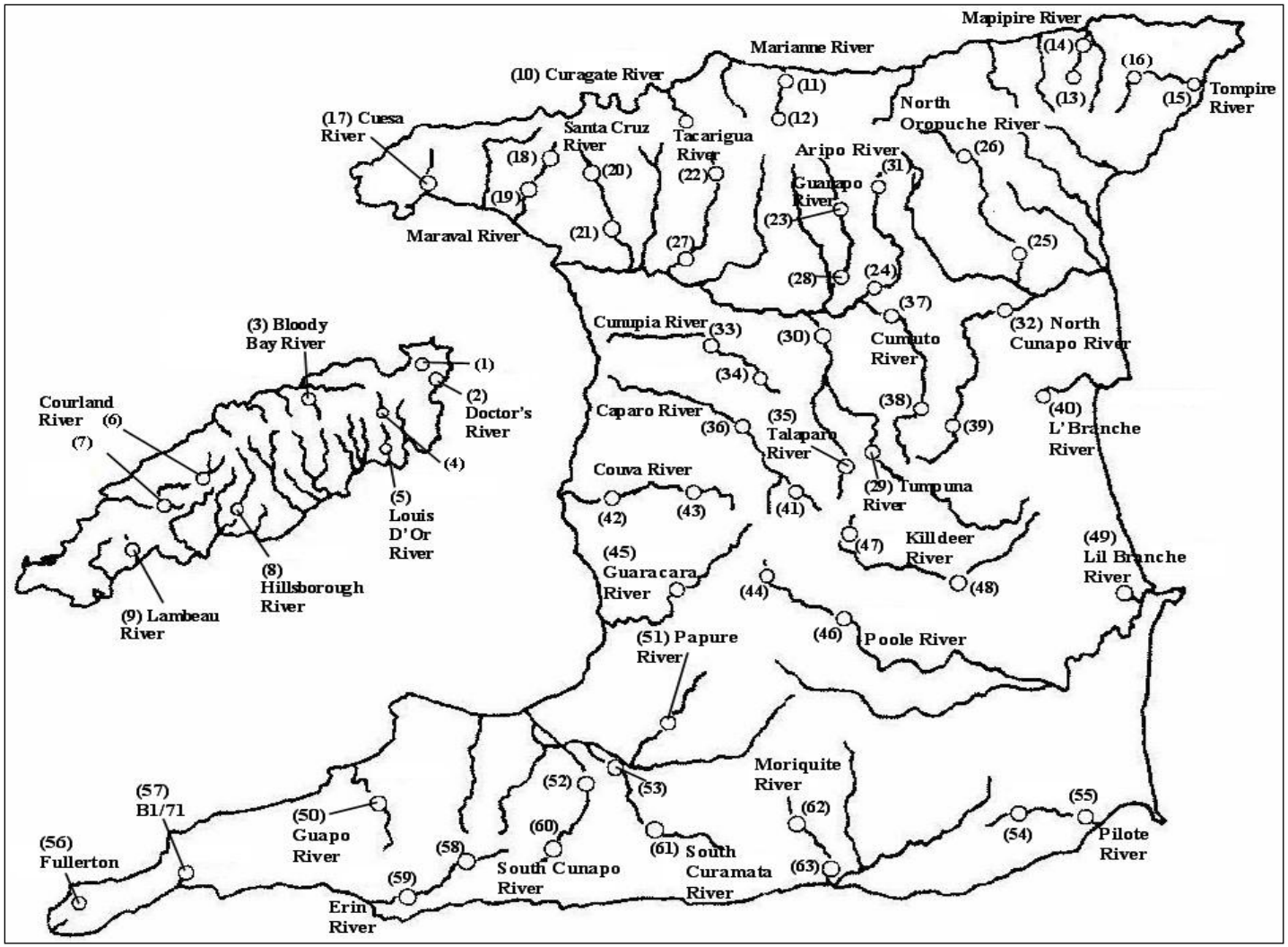


Figure 2.17: Map of sites sampled for benthic macroinvertebrate survey in Trinidad and Tobago (not to scale)

Table 2.5: List of Physicochemical parameters and biological metrics measured at sites in Trinidad and Tobago

Physicochemical Parameters/Substances (Units)	Biological Metric
Temperature (°C)	Number of Taxa
Dissolved Oxygen (mg/L)	Number of Ephemeropteran, Plecopteran & Trichopteran Taxa
Five Day Biological Demand (mg/L)	Simpson's Dominance Index (*l*)
pH (pH Units)	Simpson's Diversity Index (Ds)
Alkalinity (mg/L)	Simpson's Reciprocal Index (ds)
Total Hardness (mg/L)	Shannon-Weiner Index (H')
Conductivity (µS)	Average Density (Number individuals/m^2)
Salinity (ppt)	% Dominant Taxon
Total Suspended Solids (mg/L)	Modified BMWP Score
Total Dissolved Solids (mg/L)	ASPT Score
Nitrate-N (mg/L)	
Total Phosphates (mg/L)	
Chlorophyll-a (mg/L)	
Total Oil & Grease (mg/L)	

Source: Maharaj & Alkins-Koo, 2007

Of the different metrics, a version of the Biological Monitoring Working Party's (BMWP) Average Score Per Taxon (ASPT score) which was originally developed for rivers in the United Kingdom and modified for local streams, was found to best discriminate between the different categories of habitat impairment. Using the ASPT score, 21% of the sites surveyed were categorised as minimally impaired, 62% moderately impaired and 16% severely impaired (Figure 2.18). The study also found that increased levels of habitat impairment were correlated in increased proportions of certain taxonomic groups, in particular Oligochaetes, Chironomidae (Diptera), Thiaridae (Gastropoda) and Hydrobiidae (Gastropoda).

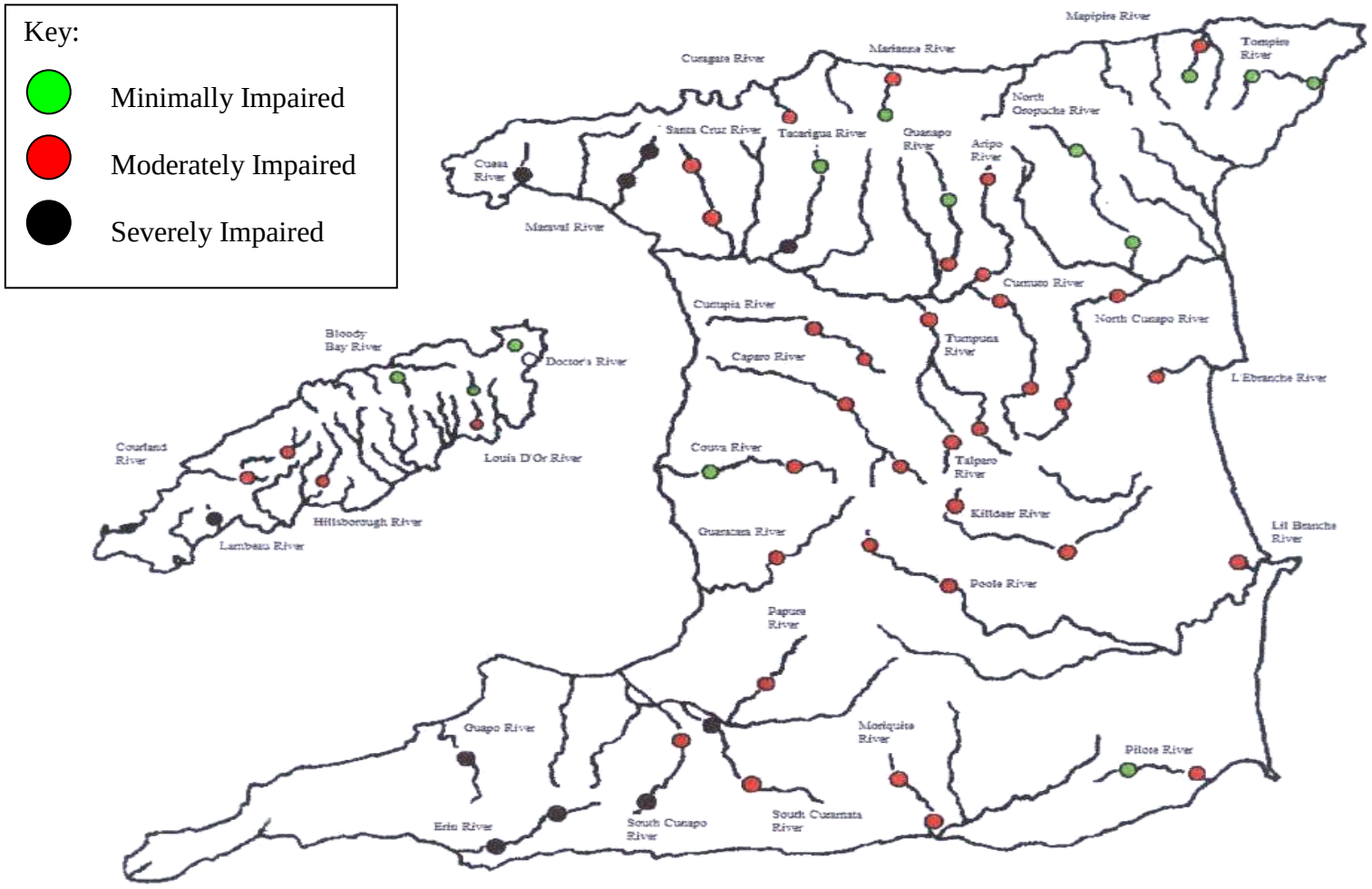


Figure 2.18: Classification of sites in Trinidad and Tobago according to the modified ASPT score (not to scale)

Recreational Water Quality

In a study commissioned by the EMA in 2007, the water quality of several recreational sites throughout Trinidad and Tobago (both inland freshwater and coastal marine locations) was monitored during the period May and July 2007. The short time period for this study provided only a snapshot of existing conditions and consequently no clear trends could be identified. The list of sites investigated is given in Table 2.6.

Table 2.6: List of recreational sites in Trinidad and Tobago selected for water quality testing

Island	Site	Type	
		Marine	Freshwater
Trinidad	Caura River		✓
	North Oropouche River (aka Valencia River)		✓
	Caroni River		✓
	South Oropouche*	✓	✓
	Maracas Bay	✓	
	Chaguaramas Bay	✓	
	Vessigny Beach	✓	
	Salybia Beach	✓	
Tobago	Englishman's Bay	✓	
	Argyle Falls		✓
	Charlotteville Bay	✓	

* Two (2) sampling points were monitored at each site listed above. At South Oropouche, one (1) of these sites was marine, the other freshwater.

Source: Environmental Management Authority 2007

A total of six (6) parameters, representing a combination of physicochemical and microbial factors were monitored (Table 2.7) and compared against several international guidelines for recreational water quality, namely: World Health Organisation (WHO) Guidelines for Safe Recreational Environments (2003), Guidelines for Canadian Recreational Water Quality (1999), Australian and New Zealand Guidelines for Fresh

and Marine Water Quality (2000) and the USEPA Bacterial Water Quality Standards for Recreational Waters (Freshwater and Marine Waters) (2003). These guidelines for the parameters listed in Table 2.7 are summarised in Table 2.8.

Table 2.7: Water quality parameters monitored at recreational sites in Trinidad and Tobago

Physicochemical Parameters (Units)	Microbial Parameters (Units)
Temperature (°C)	Faecal Coliform (CFU/100 ml)
pH (pH units)	*Enterococci* (CFU/100 ml)
Dissolved Oxygen (mg/L)	*Escherichia coli* (CFU/100 ml)
Total Petroleum Hydrocarbons (mg/L)	

Source: Environmental Management Authority 2007

Table 2.8: International guidelines for Recreational water quality

Parameter (Units)	WHO Recreational Water Guideline Values (2003)	Guidelines for Canadian Recreational Water Quality (1999)	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)	USEPA Bacterial Water Quality Standards For Recreational Waters (2003)
Temperature (°C)	N/A	< 35°C	< 35	N/A
pH (pH Units)	6.5 – 9.5	6.5 – 9.5	5 - 9	N/A
Dissolved Oxygen (mg/L)	N/A	N/A	> 6.5	N/A
Total Petroleum Hydrocarbons (mg/L)	N/A	N/A	200 mg/L	N/A
Faecal Coliforms (CFU/100 ml)	N/A	200 (fresh water only)	150	N/A
Enterococci (CFU/100 ml)	40 (Marine Water only)	200 (Marine Water only)	35	33 (Freshwater only) 35 (Marine Water only)

Parameter (Units)	WHO Recreational Water Guideline Values (2003)	Guidelines for Canadian Recreational Water Quality (1999)	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)	USEPA Bacterial Water Quality Standards For Recreational Waters (2003)
Escherichia coli (CFU/100 ml)	40 (Freshwater only)	35 (Freshwater only)	N/A	126 (Freshwater only)

N/A Not Applicable
Source: Environmental Management Authority 2007

These investigations revealed that while levels of the physicochemical parameters at all monitored sites were within international guidelines set for human health, many of the microbial levels exceeded these standards and therefore pose serious human health risks. Comparisons of Faecal Coliform, *Enterococci* and *Escherichia coli* levels obtained at the freshwater recreational sites against these international guidelines are presented in Figures 2.19-2.21 respectively. These results indicate that only one (1) sample collected at South Oropouche during May was within the guidelines suggested for Faecal Coliforms, while no site was within the guidelines recommended for *Enterococci* and *E. coli* levels. The results obtained at marine recreational sites are presented and discussed in Section 2.2.1.

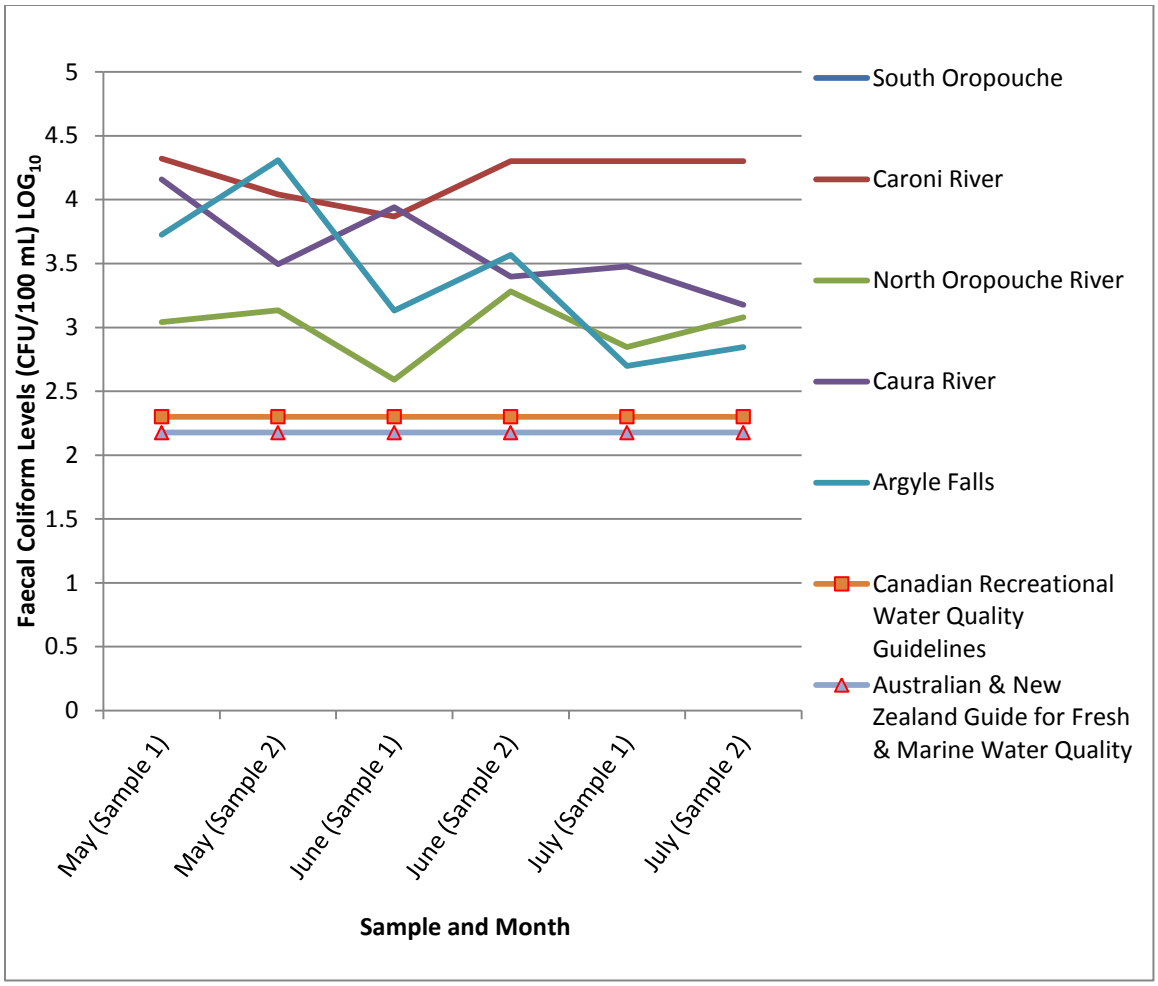


Figure 2.19: Variation in faecal coliform levels (CFU/100 ml) at selected inland freshwater recreational sites across Trinidad and Tobago (2007) – LOG_{10} Scale

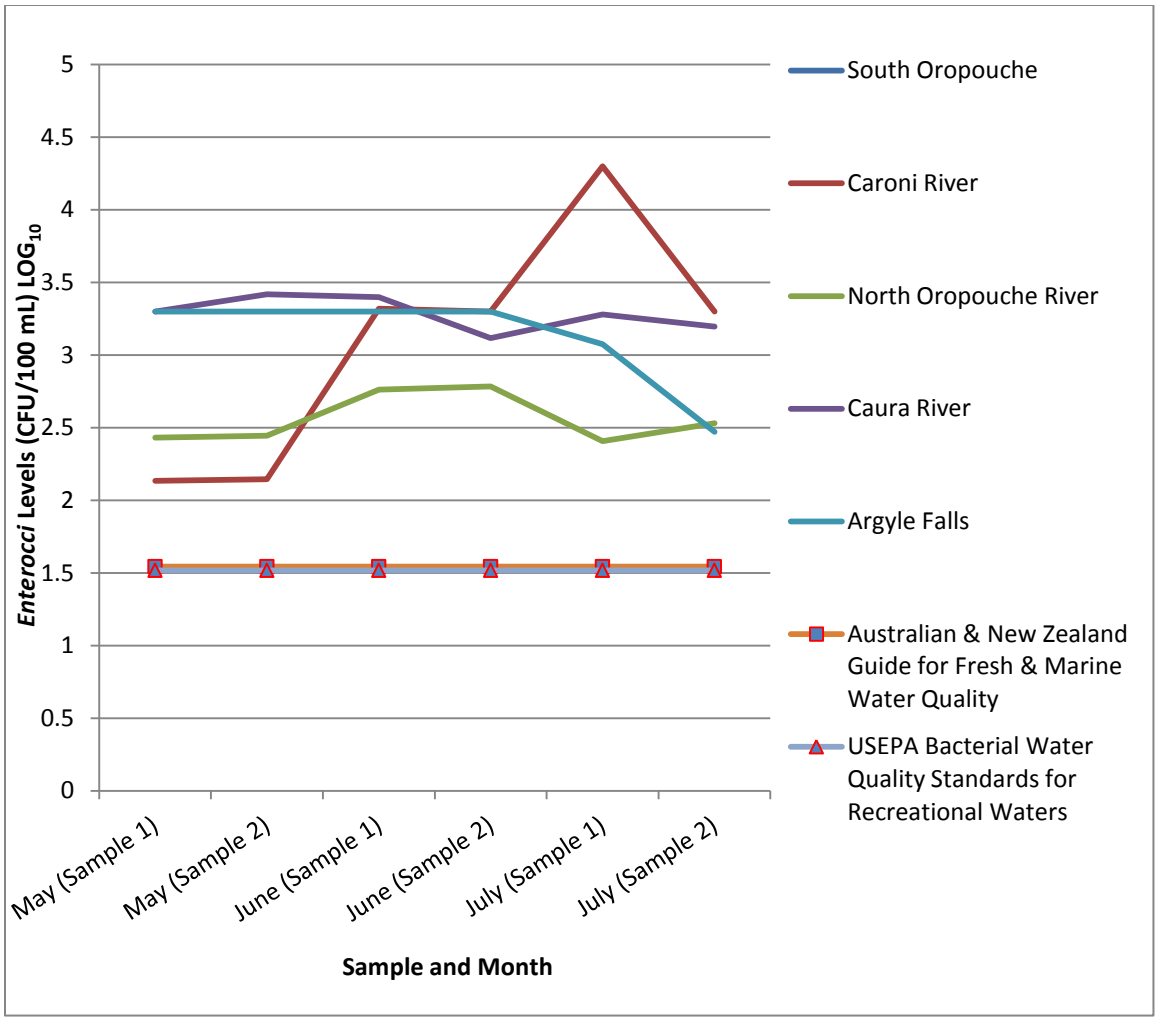


Figure 2.20: Variation in *Enterococci* levels (cfu/100 ml) at selected inland freshwater recreational sites across Trinidad and Tobago (2007) – LOG_{10} Scale

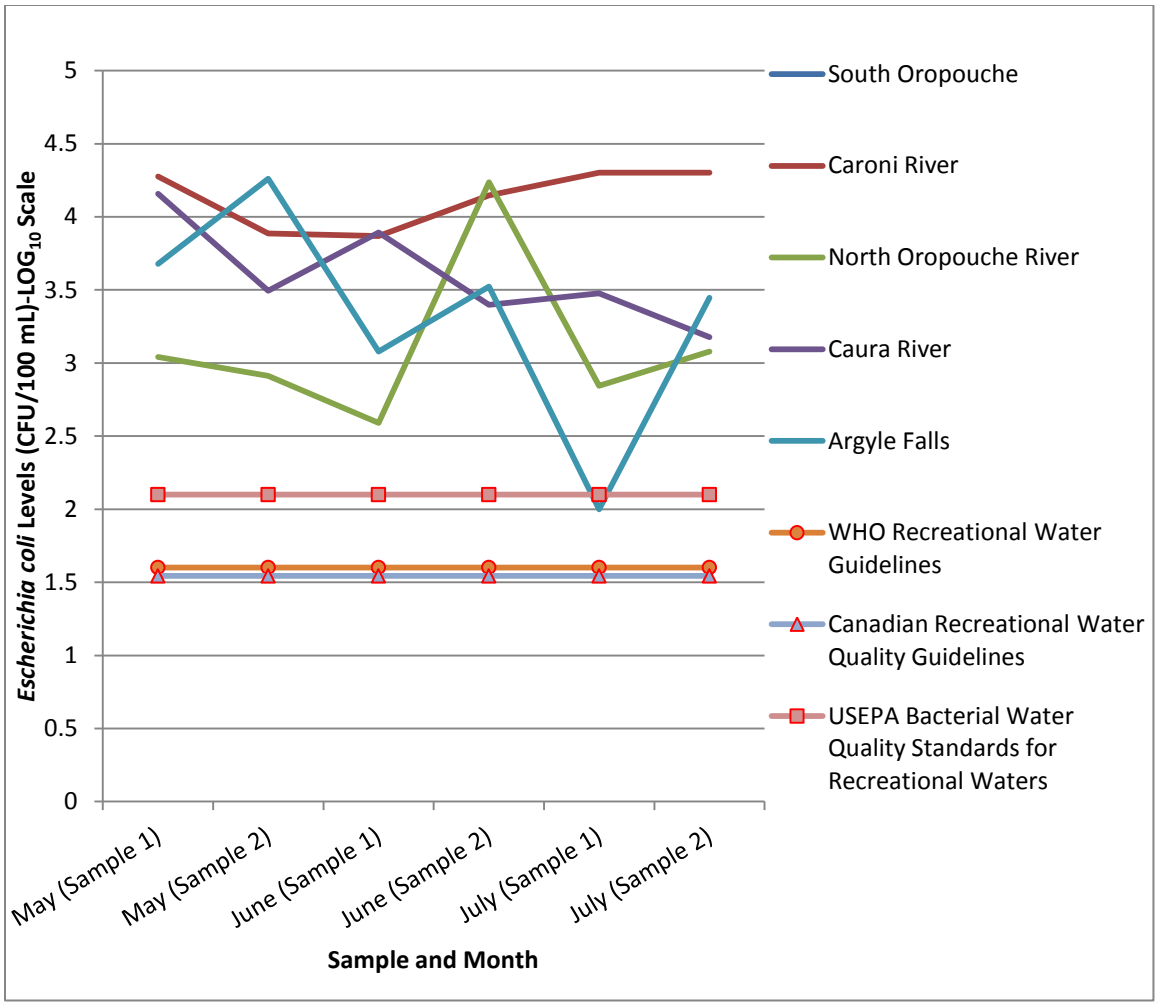


Figure 2.21: Variation in *Escherichia coli* levels (cfu/100 ml) at selected inland freshwater recreational sites across Trinidad and Tobago (2007) – LOG_{10} Scale

2.2 Coastal and Marine

2.2.1 Coastal and Marine Water Quality

Pollution in the coastal and marine environments arises from two sources – either from activities on land, or from activities in the coastal/offshore environment. A characterization of the land-based sources and activities affecting the coastal/marine environment in Trinidad and Tobago is given in Table 2.9. It is worth pointing out that because almost all of the land-based activities/contaminants which affect coastal water quality arise inland, they also affect inland water-source quality.

Table 2.9: Land-based sources of pollution and activities in Trinidad and Tobago

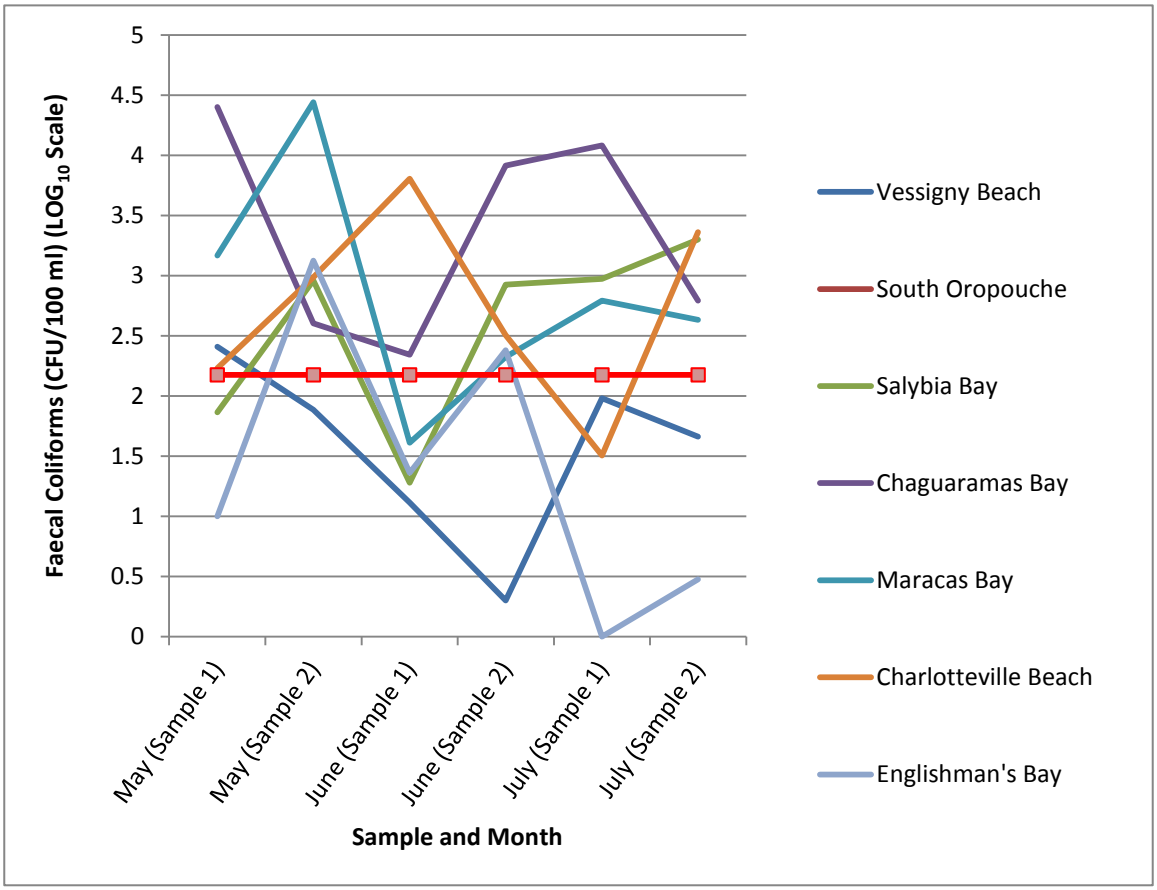
Containment or Alteration	Major Sources or Causes of Pollution	Land Use Activities
Sewage	Inadequately treated effluent from sewage treatment plants Septic tanks Pit latrines Animal waste Industrial effluent	Residential, Industrial, Tourism Residential, Industrial, Tourism Residential Intensive animal husbandry Industrial
Persistent Organic Pollutants	Runoff containing excessive pesticides Animal waste Improperly disposed insecticides, rodenticides Chemicals contained in termite treatment PCBs in industrial use	Agricultural Intensive animal husbandry Residential, Commercial, Industrial, Residential, Commercial Industrial
Heavy metals	Petroleum mining and refining Petrochemical plants Boatyards and marinas Leaking underground gasoline storage tanks	Industrial (Petrochemical, Extractive) Industrial (Petrochemical) Industrial, Tourism (Yachting) Commercial
Oils (Hydrocarbons)	Petroleum production and refining Spent lubricating oils Leaking underground gasoline storage tanks Boatyards and marinas	Industrial (Petrochemical, Extractive) Commercial, Industrial Commercial Industrial, Tourism (Yachting)
Nutrients	Sewage Grey water (from showers, laundries, etc.) Animal waste Runoff containing excess fertilizers, crop residues Abattoirs Effluents from ammonia production, food	Residential, Commercial, Industrial Residential, Tourism Intensive animal husbandry Agriculture Industrial

Containment or Alteration	Major Sources or Causes of Pollution	Land Use Activities
	processing plants, beverage manufacturers, sugar refineries, rum distilleries, breweries	
Sediments	Deforestation of hillsides for development purposes Slash and burn agriculture Forest fires and timber harvesting Discharges from gravel quarry wash plants Careless construction stage practices Reclamation of land Beach sand mining Installation of coastal protection structures	Residential, Infrastructural, Agricultural Industrial (Extractive/ Mining) All development/ land use activities All development/ land use activities All development/ land use activities All development/ land use activities Residential, Tourism
Litter/ solid waste	Improper disposal of consumer goods Inadequate waste collection, disposal infrastructure	Residential, Commercial, Industrial Residential, Commercial, Industrial
Toxic and other wastes	Solid and liquid waste from industrial operations Landfills and dumps that leak toxic substances	Industrial Land-filling/ waste disposal
Physical Alterations and Destruction of Habitat	Reclamation of wetlands Installation of coastal protection structures Dredging to develop and maintain harbours Beach sand mining	All land use activities All land use activities Ports and harbours/ Infrastructure All land use activities

Source: T&T National Programme of Action for the Protection of the Coastal and Marine Environment from Land-based Sources and Activities, 2008-2013 – Institute of Marine Affairs and UNEP, February 2008

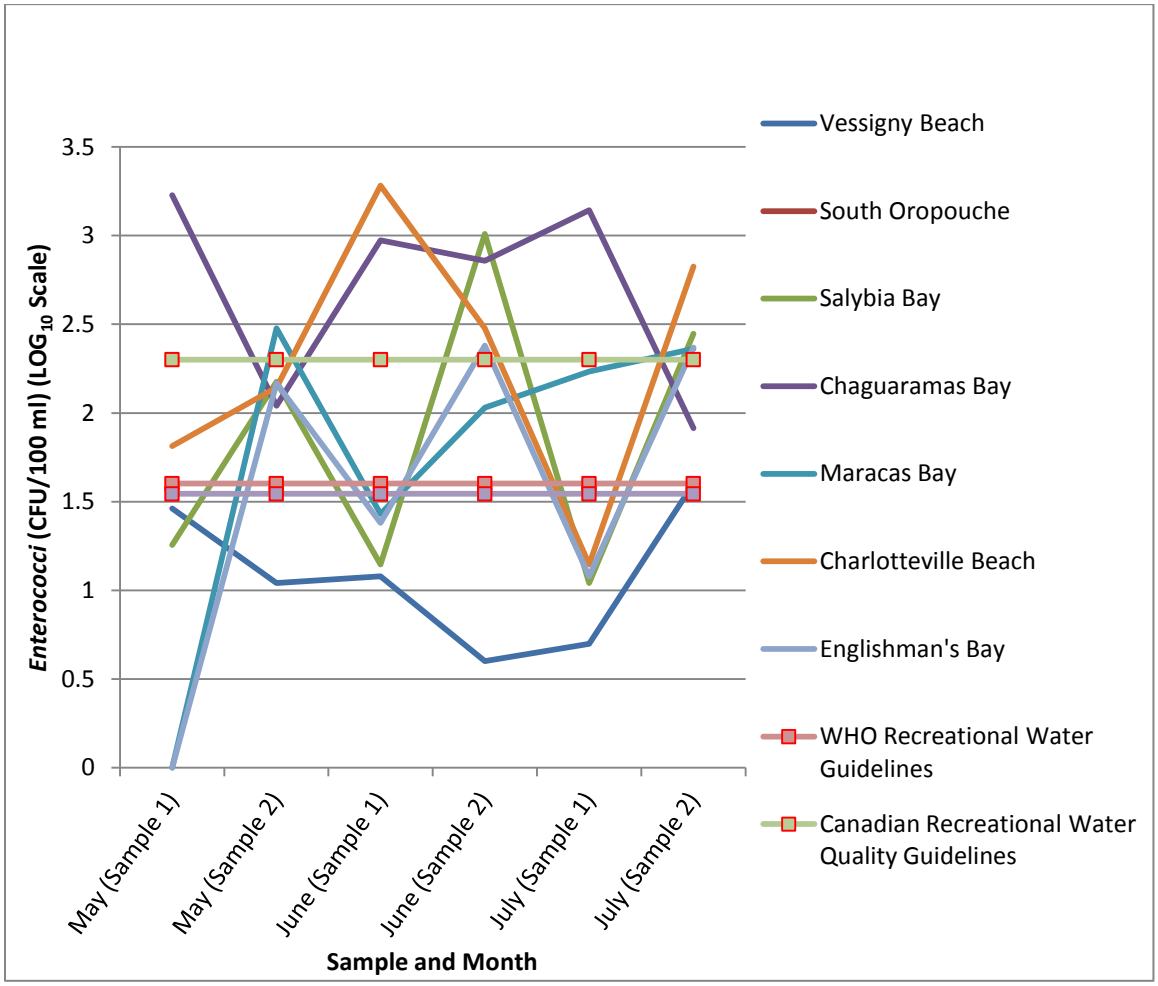
As at 2007, Trinidad and Tobago had not established a systematic water quality monitoring programme for the coastal and marine areas of Trinidad and Tobago, but *ad hoc* studies undertaken in 2007 indicate a decline in the quality of our coastal and marine waters in some areas.

The coastal water quality assessment commissioned by the EMA in 2007 showed that at the seven (7) beaches studied, many sites exceeded international microbial water quality standards (Figures 2.22 and 2.23). Given the popularity of many of the sites for recreation, the health implications for humans, especially as related to gastrointestinal diseases, have become a source of concern.



Source: Environmental Management Authority 2007

Figure 2.22: Variation in Faecal Coliform Levels (CFU/100 ml) at selected coastal recreational sites across Trinidad & Tobago (LOG_{10} Scale)



Source: Environmental Management Authority 2007

Figure 2.23: Variation in Enterococci Levels (CFU/100 ml) at selected coastal recreational sites across Trinidad & Tobago (LOG10 Scale)

Based on the water quality study it was suggested that the following activities may contribute in various combinations to the microbiological contamination detected in the recreational sites (both inland and coastal) investigated:

- Farming activities[11] with inadequate facilities for dealing with run-off;

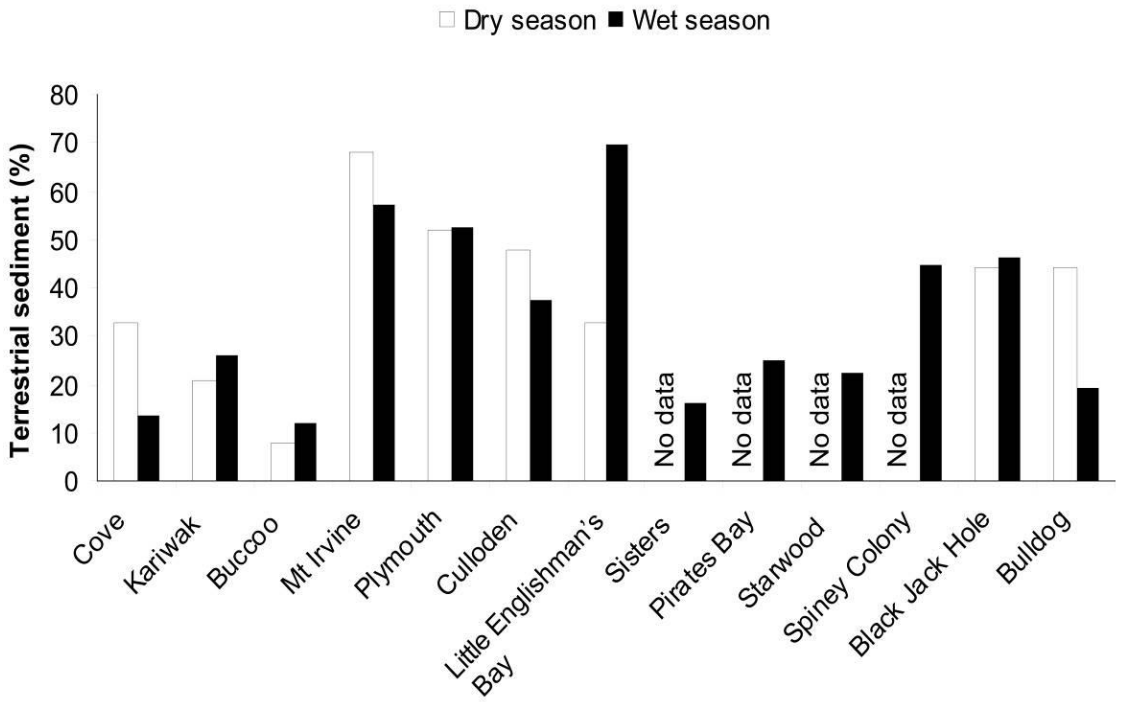
[11] These farming activities are mostly related to animal husbandry.

- Inadequate sewage treatment systems in residential properties (some illegal) in close proximity to recreational areas;
- Use of sites for purposes other than recreational e.g.: religious ceremonies;
- Run-off from fishing depot washing directly into recreational site;
- Use of fresh water sites for domestic bathing purposes;
- Effluent discharges from yachts and commercial businesses along shorelines;
- Poor sanitary practices of the bathing public.

Another study undertaken in Tobago in 2007 to determine the percentage of terrestrial sediment settling onto Tobago's coral reefs, estimated that on average, 30% of the sediment on Tobago's reefs is derived from inland sources. The results of this study are shown in Figure 2.24. Reef sedimentation can potentially have several consequences for coral reef ecosystems, including, but not limited to:

- The introduction of toxic chemicals and materials;
- The introduction of pathogens which can cause coral diseases;
- Reduction of sunlight levels reaching corals for photosynthesis;
- Smothering of corals causing them to expend large of amounts of energy to keep themselves clean.

When sedimentation levels are high enough, the above-mentioned effects can cause mortality and thus reductions in reef productivity and size. Given the significant contribution of Tobago's reefs to the island's income, (refer to the 2006 ASOE), continued pollution of coral reef systems will be expected to have adverse impacts on the economy of Tobago.

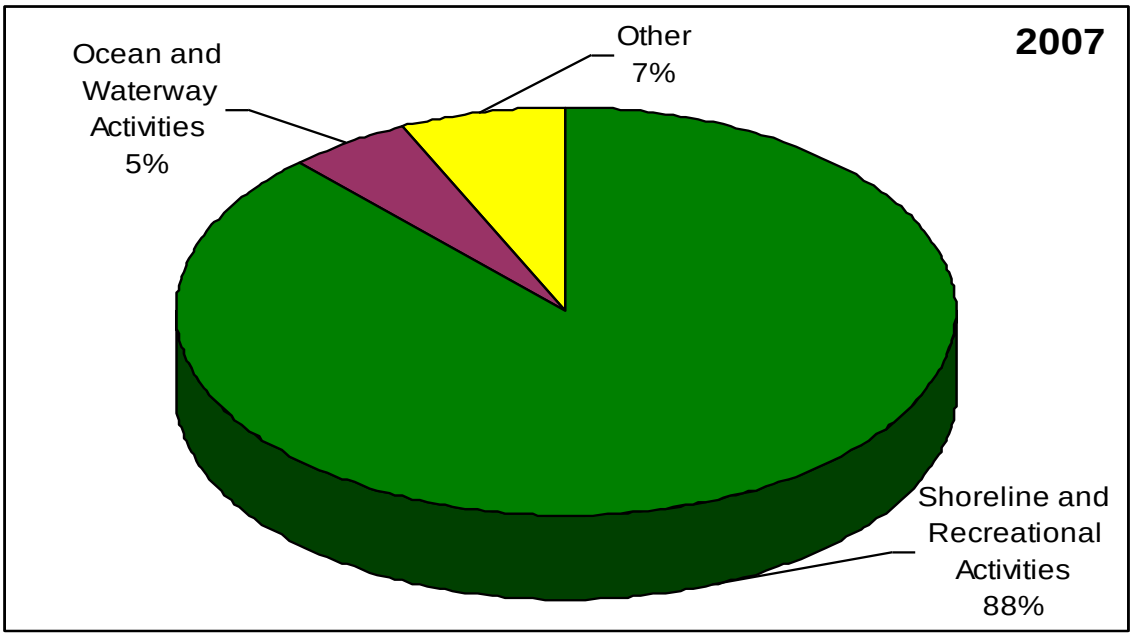


Source: Buccoo Reef Trust 2008

Figure 2.24 proportion of terrestrial sediments in coastal sediment traps from selected sites around Tobago (2007)

In addition to the pollution of coastal waters by chemicals and sewage, solid waste has also been identified as a problem which affects beach and bathing water quality. Data for 2007 generated by the National Planning Committee for the International Coastal Clean-up exercise (ICC), which is spearheaded by the Caribbean Network for Integrated Rural Development (CNIRD), indicate that significant amounts of debris were collected from the beaches around Trinidad and Tobago as a part of the annual 2007 ICC[12]. Figure 2.25 shows that for 2007 shoreline and recreational activities were the major contributors of debris in the coastal area.

[12] More information on the International Coastal Clean-up is available at: http://www.oceanconservancy.org/2007ICC/international/TrinidadTobago2007.pdf



Sources: (Institute of Marine Affairs and UNEP 2008 Unpublished; Ocean Conservancy 2008)
Other includes: Smoking-related activities, dumping activities and Medical/Personal Hygiene

Figure 2.25 Sources of debris collected during the 2007 ICC exercises in Trinidad and Tobago

An assessment of the severity of the impacts of various land based pollutants on different aspects of human well-being was completed by the Institute of Marine Affairs (IMA) and UNEP (IMA and UNEP 2008 unpublished)[13]as part of the development of the (2008 – 2013) National Programme of Action for the Protection of the Coastal and Marine Environment from Land-based Sources and Activities (NPA) (see Table 2.10). Of the categories considered, it was concluded that the issues of greatest priority in Trinidad and Tobago are:

1. Sewage
2. Persistent Organic Pollutants (POPs)
3. Litter/Solid Waste
4. Nutrients
5. Physical Alteration and Destruction of Habitats (PADH)

[13] This document has not yet been approved by Cabinet and is still in draft form.

Table 2.10 Severity of impacts of land-based sources of pollution on various aspects of human well-being

Contributing Factor	Food Security and Poverty Alleviation	Public Health and Safety	Ecosystem Health	Economic and Social Benefits. Uses	Total
Sewage	3.00	3.00	3.00	3.00	12.00
POPs	3.00	3.00	3.00	3.00	12.00
Heavy Metals	2.00	2.17	2.17	2.00	8.34
Oils (Hydrocarbons)	2.17	2.17	3.00	2.17	9.51
Nutrients	3.00	2.00	3.00	2.17	10.17
Sediments	2.17	1.75	3.00	2.80	9.72
Litter/Solid Waste	2.17	2.30	3.00	3.00	10.47
Toxic, other Wastes	2.30	2.50	2.30	2.30	9.40
PADH	3.00	2.00	3.00	2.00	10.00

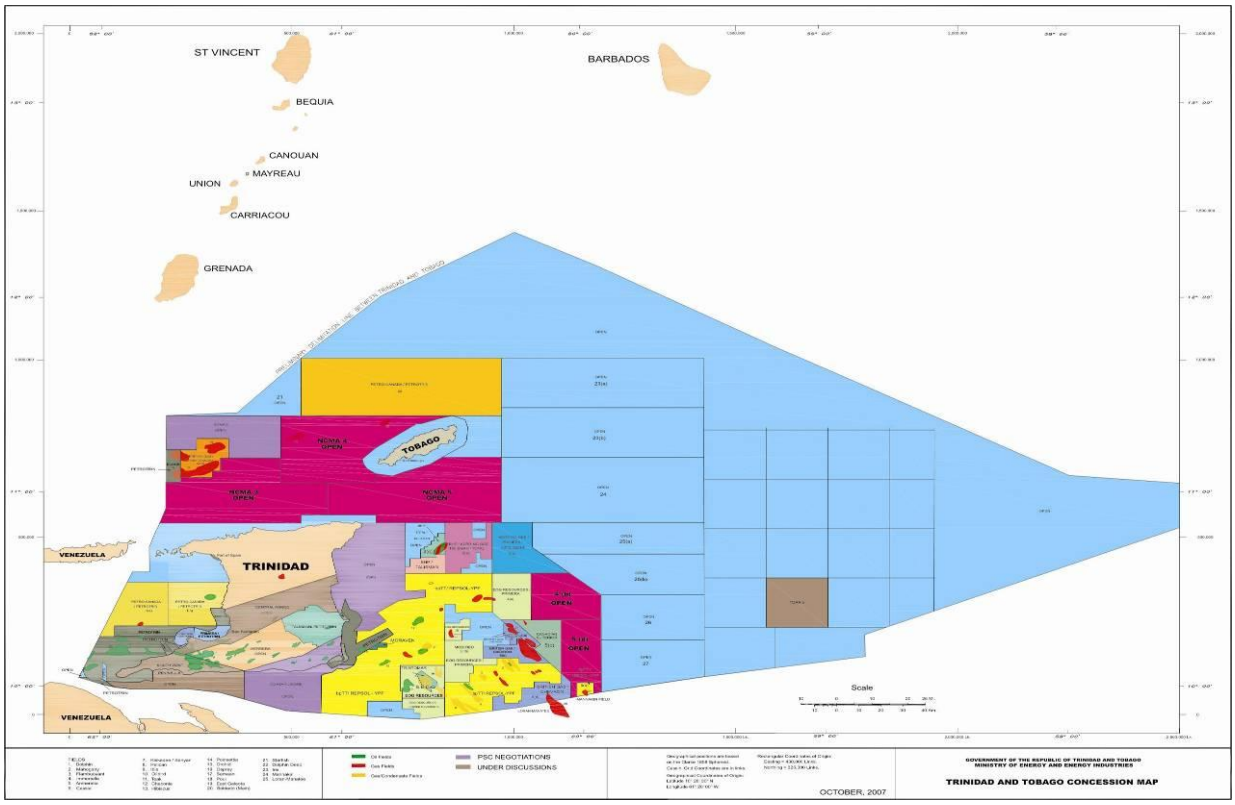
1 – Low Impact 2 – Medium Impact 3 – High Impact

For each factor, the severity of each impact was given a weighted score out of 3. The total severity for each factor was then calculated by finding the sum of the scores awarded to the four individual impacts.
Source: IMA and UNEP 2008 (Unpublished).

The growth of the offshore oil and gas industry has also been raising concerns regarding marine water quality. Figure 2.26 is an offshore concession map for Trinidad and Tobago which shows the allocation of blocks to different oil and gas exploration companies as at December 31st 2007. The figure shows the highest intensity of activity on the south-east coast, but it is evident that oil and gas exploration and development is occurring in the waters off all coasts of Trinidad.

Among the several potential impacts which oil and gas exploration and development could have on the marine offshore environment, two have recently been given attention. The first relates to the disposal of the by-products of the drilling process. During the

drilling of wells (whether exploratory or for production of oil and gas), operators in many cases dispose of rock fragments and drilling fluids (which contain dense materials such as barite as well as heavy metals and other pollutants) directly overboard. The heavy metals and other aqueous components of the fluids are often quickly dispersed in open ocean currents and once properly mitigated, have not been demonstrated to have adverse impacts on marine pelagic life. In near-shore waters however, the potential impact of such substances increases and there can potentially be impacts on fisheries. It should be noted that most of the activity in Trinidad and Tobago occurs miles offshore, but there are companies who operate in near-shore waters.



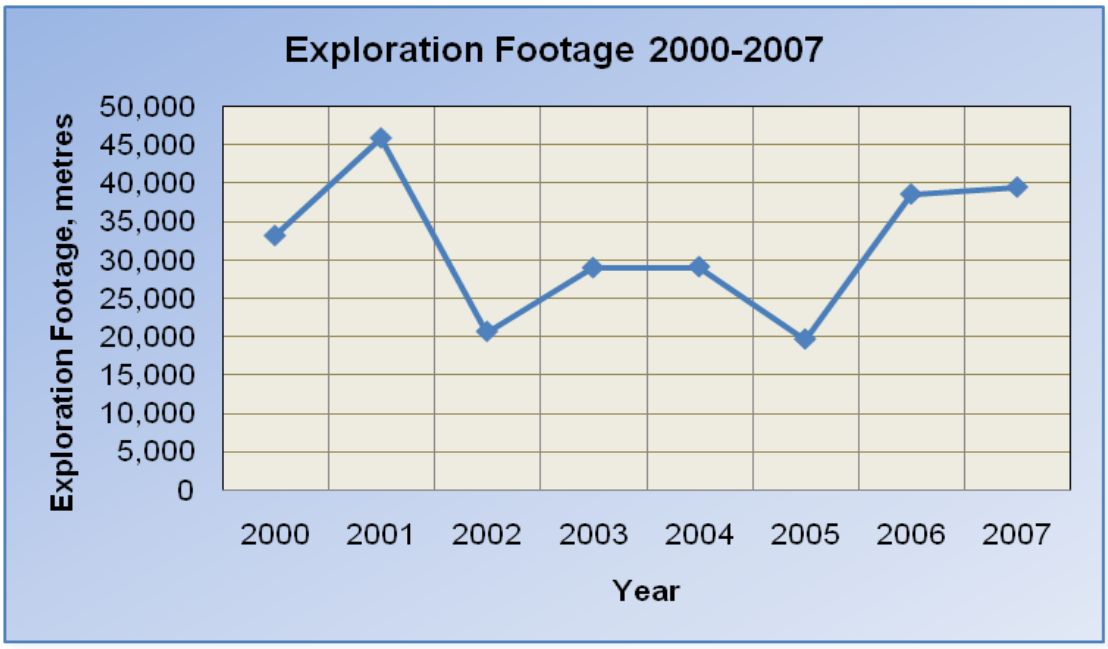
Source: Ministry of Energy and Energy Industries, 2008

Figure 2.26: Trinidad and Tobago offshore concession map (2007)

The rock fragments and other heavy particulates such as barite settle to the ocean bottom and can have an impact on benthic communities either through smothering or by causing abrasions. Although benthic communities have been shown to regenerate in time [approximately five (5)years after dumping], these activities still need to be carefully monitored. One (1) indicator of the potential extent of the impact of heavy particulates is the volume of displaced matter being generated by the drilling process, and the

exploration footage (or total length of all wells drilled) gives a rough estimate of this (Figure 2.27). What is evident from this figure is that in 2007, there was an increase in the exploration footage when compared with the five (5) previous years.

These data do not conclusively show or try to make the case that offshore oil and gas exploration activities are having a significant impact on the coastal/marine environment, especially the benthos. But this is one aspect of our local activities which should continue to be monitored effectively.



Source: Ministry of Energy and Energy Industries 2008

Figure 2.27 Exploration footage in Trinidad and Tobago (2000 – 2007)

Oil spills are the second type of environmental impact which has been given consideration because of the potentially devastating effects on marine and coastal life. Data from the Ministry of Energy and Energy Industries for the period 2005 to 2007 (Table 2.11) indicate that there are far fewer reported marine spills when compared with land spills. While it is possible that the number of marine spills for the 2005/2007 period is under-reported, the effects of oil spills do not appear to be very frequent or widespread in and around Trinidad and Tobago. Having established this however, it does not mean that these occurrences (actual or potential) should be overlooked.

Table 2.11: Reported oil spills in Trinidad and Tobago (2005 – 2007)

Cumulative Oil Loss 2005			
Location	**No. of Incidents**	**Spilled /bbl**	**Recovered /bbl***
Land	97	1,012.55	822
Marine	4	6	0
Total	**101**	**1,018.55**	**822**
Cumulative Oil Loss 2006			
Location	**No. of Incidents**	**Spilled /bbl**	**Recovered /bbl**
Land	87	2,868.67	2,333.62
Marine	3	10.06	0
Total	**90**	**2,878.73**	**2,333.62**
Cumulative Oil Loss 2007			
Location	**No. of Incidents**	**Spilled /bbl**	**Recovered /bbl**
Land	79	3903.24	TBD[Ŧ]
Marine	5	15.01	4
Total	**84**	**3918.25**	**TBD**

Source: Ministry of Energy and Energy Industry, Health, Safety and Environment Measurement Division 2008

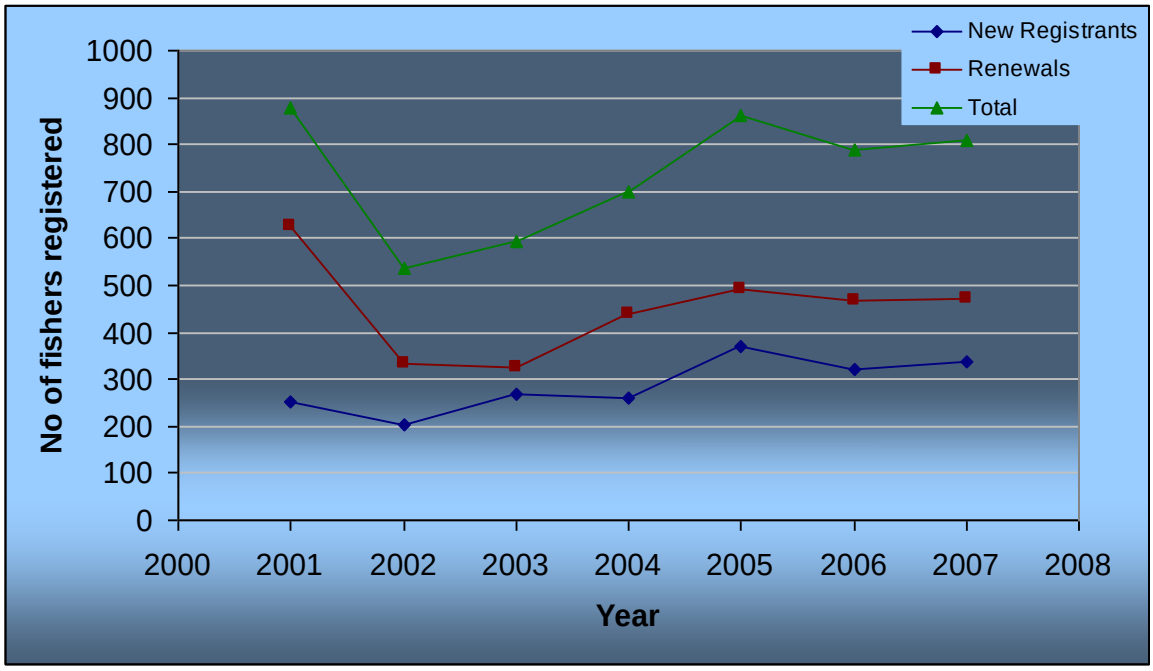
*bbl – Barrels; TBD[Ŧ] – To be determined

2.2.2 Coastal/Marine Resources

Although the contribution of fishing to national GDP in Trinidad and Tobago is relatively low, the livelihoods of several coastal communities depend almost exclusively on fisheries. Data provided by the Ministry of Agriculture, Land and Marine Resources[14] show that as at 2007, there were approximately 800 newly registered (including

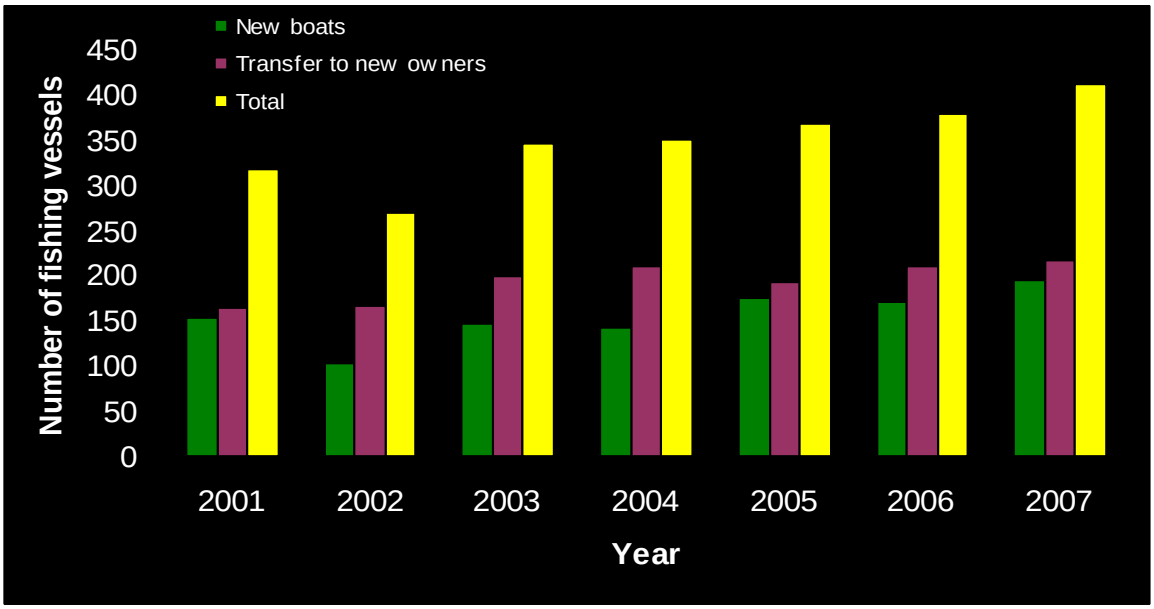
[14]Source: http://www.agriculture.gov.tt/documentlibrary/downloads/55/Final%20Fisheries%20and%20Aquaculture%20Statistics.pdf

renewals) fishers in the country (Figure 2.28), and that between 2001 and 2007 there was an overall increase in the number of new (including renewals) fishing vessels (Figure 2.29).



Source: Ministry of Agriculture, Land and Marine Resources 2008

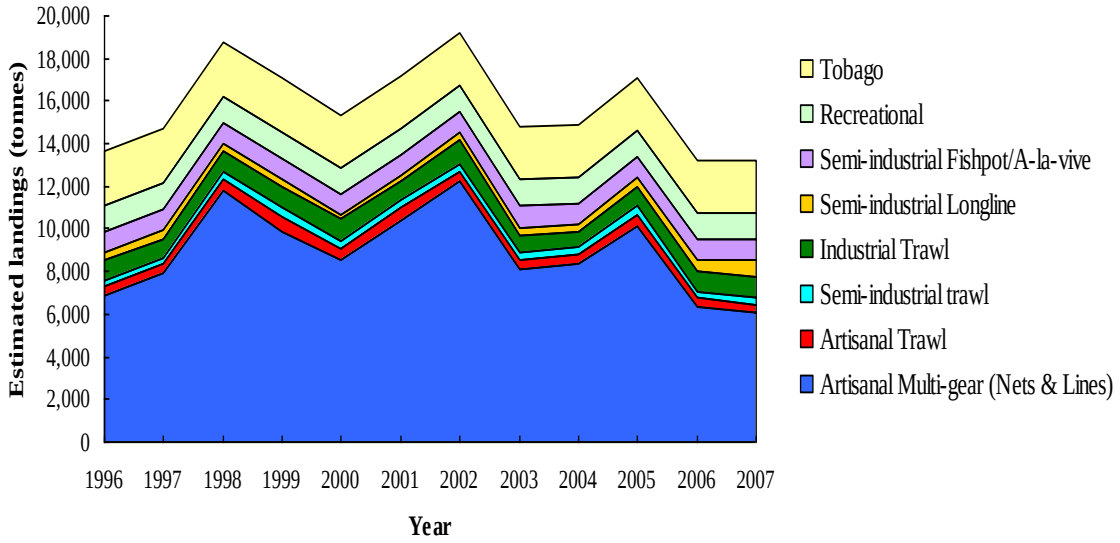
Figure 2.28: Number of new and renewal fishers registered in Trinidad and Tobago (2001 – 2007)



Source: Ministry of Agriculture, Land and Marine Resources 2008

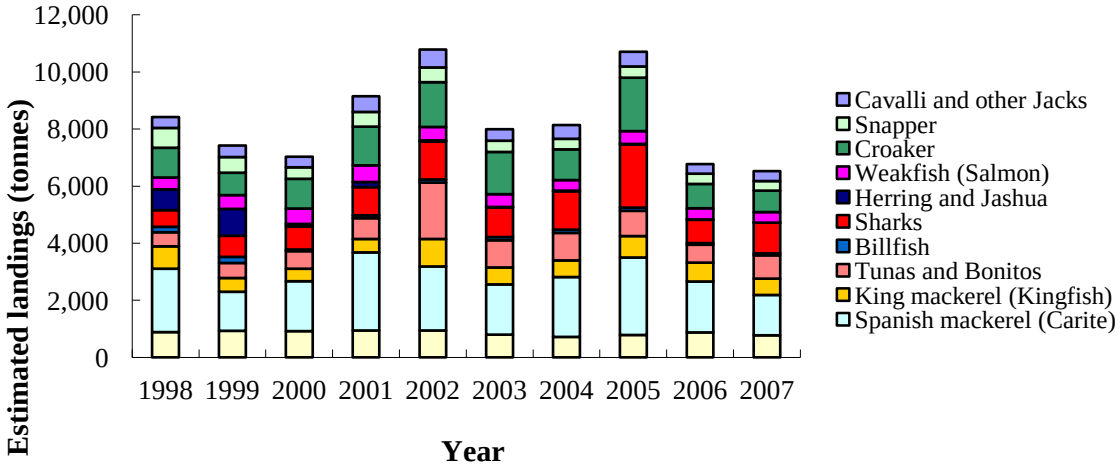
Figure 2.29: Number of new and renewal fishing vessels registered in Trinidad and Tobago (2001 – 2007)

Data from the Ministry of Agriculture, Land and Marine Resources show fish landings by fleet (Figure 2.30), by commercially important fish species (Figure 2.31) and by landing sites around Trinidad (Figure 2.32).What is shown by these data is that annual landings by fleet (Figure 2.33) and by commercially important fish species (Figure 2.31) remained almost constant over the 2006/2007 period. Landings by site (Figure 2.32) showed a slight decrease between 2006 and 2007, although it should be noted that datasets are not available for several sites around Trinidad which makes accurate trend analysis difficult.



Source: Fisheries Division, Ministry of Agriculture, Land and Marine Resources (2009)
Note: Data for Tobago is not disaggregated

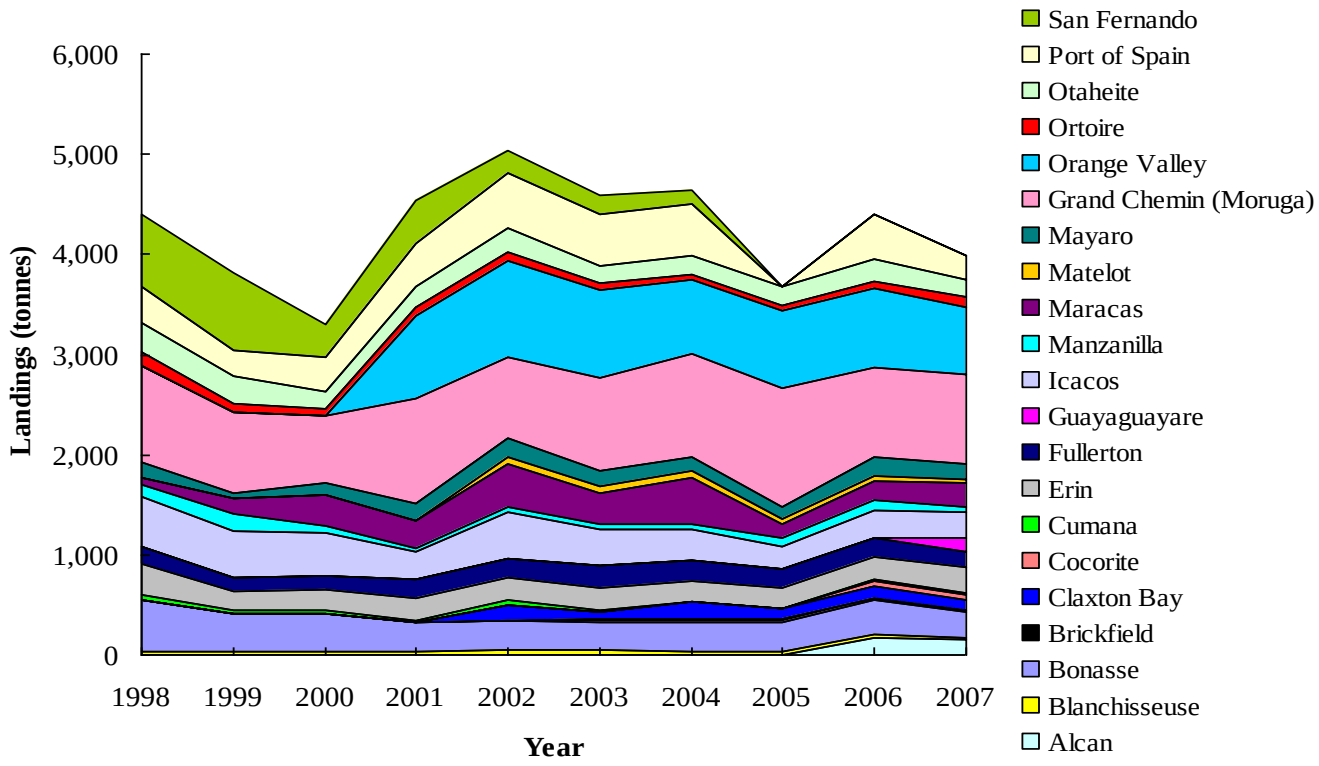
Figure 2.30: Estimated annual landings by fleet for the marine capture fisheries in Trinidad and Tobago (1996 – 2007)



Source: Fisheries Division, Ministry of Agriculture, Land and Marine Resources (2009)

Note: Landings of the Tobago inshore fisheries and flyingfish; Trinidad semi-industrial fishpot and line fleet; Trinidad and Tobago recreational boats (other than from tournaments) are not included in the graph

Figure 2.31: Estimated landings for some commercially important species groups for the marine capture fisheries in Trinidad and Tobago (1998 – 2007)



Source: Fisheries Division, Ministry of Agriculture, Land and Marine Resources (2009)

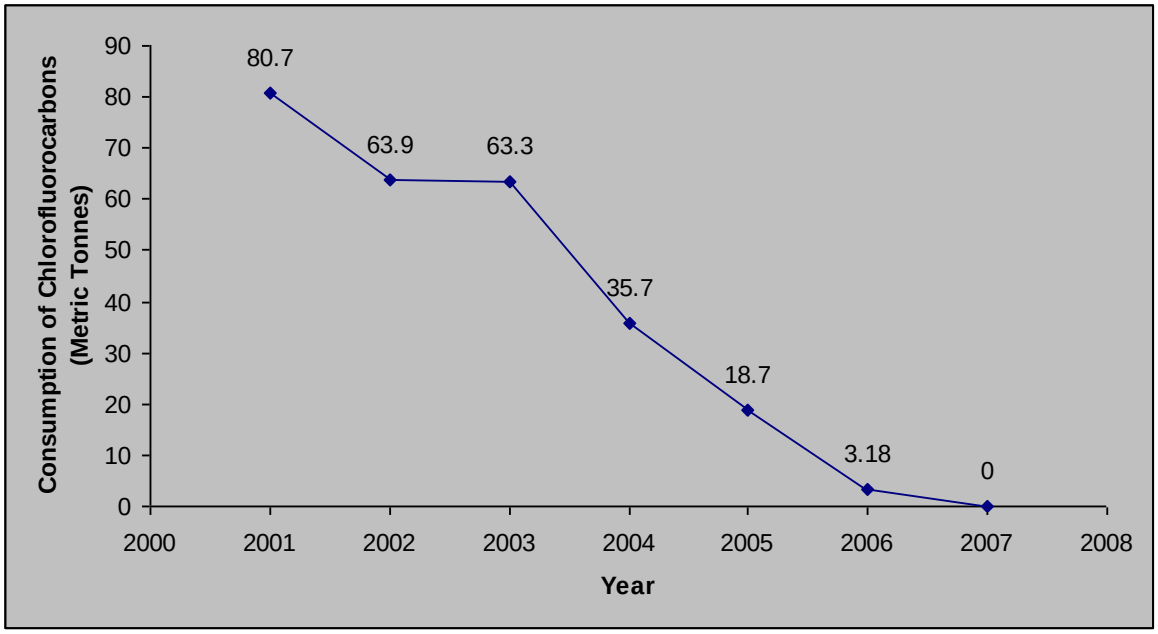
Note: Data not available for the following fish landing sites and years: Alcan and Cocorite 1998 – 2001, Brickfield 1998 – 2002, Claxton Bay and Matelot 1998 – 2001, Cumana 2004 – 2005, Guayaguayare 1998 – 2006, Orange Valley 1998 – 200, Port of Spain 2005, San Fernando 2005 – 2007

Figure 2.32: Estimated annual landings (tonnes) from the marine capture fisheries for sites around Trinidad (1998 – 2007)

2.3 Climate and Air

2.3.1 Ozone-Depleting Substances

During 2007, efforts led by the GoRTT to continue phasing out the importation and use of ozone-depleting substances such as the chlorofluorocarbons (CFCs) continued, and as Figure 2.33 indicates, the importation of CFCs was completely phased out in Trinidad and Tobago in 2007. In recognition of its achievements, Trinidad and Tobago was awarded the Montreal Protocol Implementers Award by the Secretariat for the Protocol in 2007[15].



Sources: Environmental Management Authority 2008; Ministry of Planning, Housing and Environment (pers. comm.. 2008)

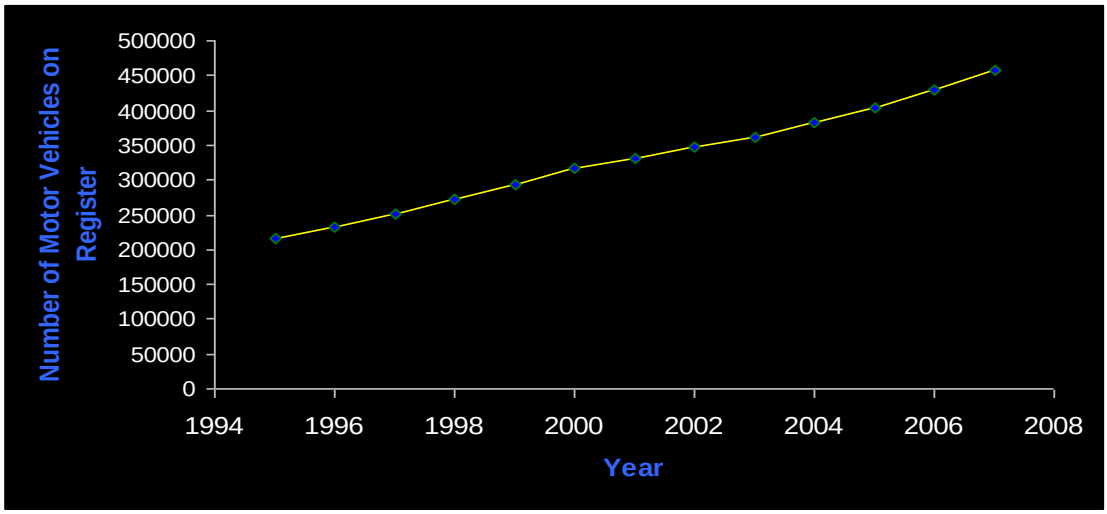
Figure 2.33: Importation of chlorofluorocarbons into Trinidad and Tobago (2001 – 2007)

[15]The Government of the Republic of Trinidad and Tobago ratified the Montreal Protocol on Substances That Deplete the Ozone Layer (commonly known as the Montreal Protocol) in 1989, and since then has been taking steps (see the National Environmental Policy 2005) to reduce the local consumption of CFCs and other ozone-depleting substances. For more information on the Montreal Protocol see http://www.unep.org/ozone/pdf/Montreal-Protocol2000.pdf

2.3.2 Climate and Climate Change

Despite the emphasis placed on climate change during 2007 at the international and regional levels, there were no significant advancements in local efforts to monitor and track the causes and effects of climate change. Data and information on climate change trends remained relatively scarce, and many of the trends presented in the 2005 and 2006 ASOEs remain unchanged.

As can be seen from Figure 2.34, the number of motor vehicles on register in Trinidad and Tobago continued to increase in 2007 with a total number of 457,325 cars recorded by the end of the year (Central Statistical Office, 2008).



Source: Central Statistical Office 2007[16]; 2008

Figure 2.34: Number of motor vehicles on register in Trinidad and Tobago (1995 – 2007)

[16] The First Compendium of Environmental Statistics for Trinidad and Tobago was published by the Central Statistical Office of the Ministry of Planning and Development in 2007. This Compendium was the first effort of its kind in Trinidad and Tobago to bring together key agencies and institutions with a responsibility for the collection of environmental data, and publish a document which presented all major environmental datasets for the country for all years prior to 2005. The Central Statistical Office is currently in the process of compiling the Second Compendium of Environmental Statistics which will cover the period 2005 to 2007. It is expected that this document will be published in early 2009. http://www.cso.gov.tt/cso/statistics/accounts.aspx

Based on data up to 2006, the Carbon Dioxide Information Analysis Centre (CDIAC) of the United States Department of Energy estimated Trinidad and Tobago's total annual carbon dioxide (CO_2) emissions to be less than 0.1% of total emissions on a global scale. Figure 2.35, which is a map of the world showing carbon dioxide emissions by country, illustrates how Trinidad and Tobago compares with other countries in terms of its Total CO_2 emissions. Figure 2.36 shows CO_2 emissions per person in Latin America and the Caribbean compared to world and Organisation for Economic Co-operation and Development (OECD) average emissions. Figure 2.37 shows global CO_2 emissions per capita. Analysis of the data for 2006 indicates that Trinidad ranks 6th for per capita CO_2 emissions and 72nd for total CO_2 emissions, out of 212 countries. Note that for these data, CO_2 emission sources include emissions from energy industry, from transport, from fuel combustion in industry, services, households, etc. and industrial processes, such as the production of cement.

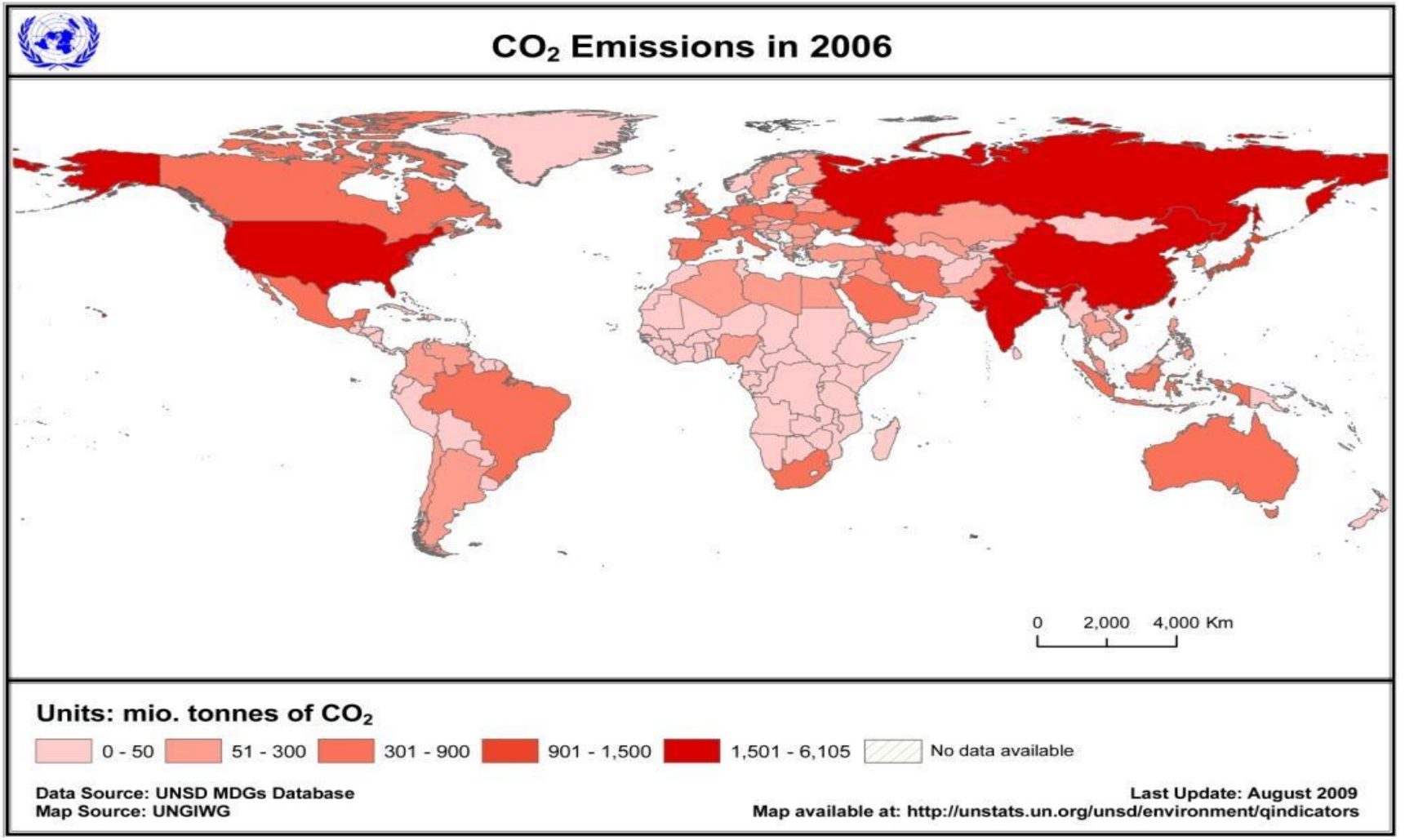


Figure 2.35: Map of the world showing carbon dioxide emissions in 2006 (T&T = 34 million tonnes CO_2 Total)

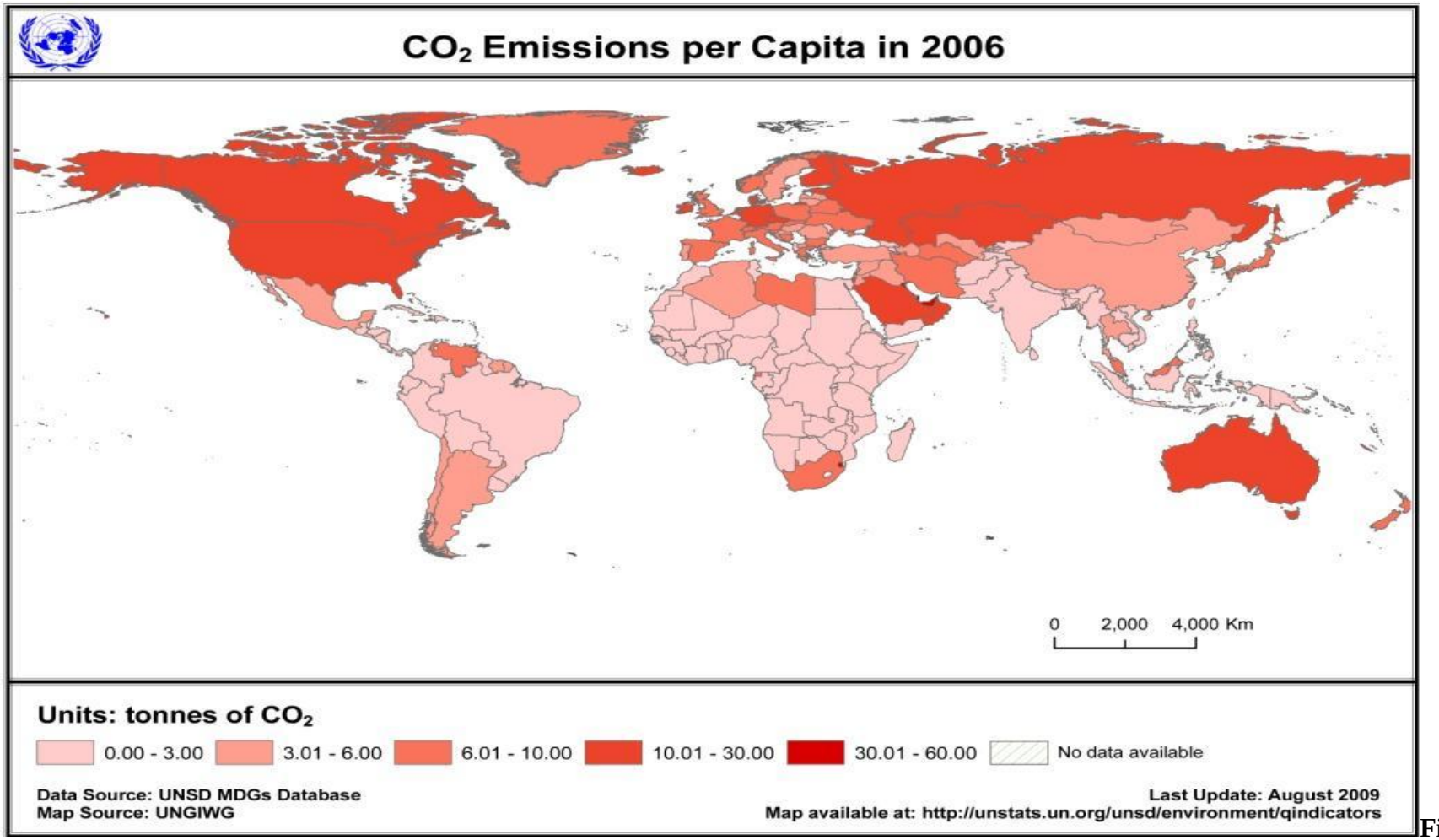
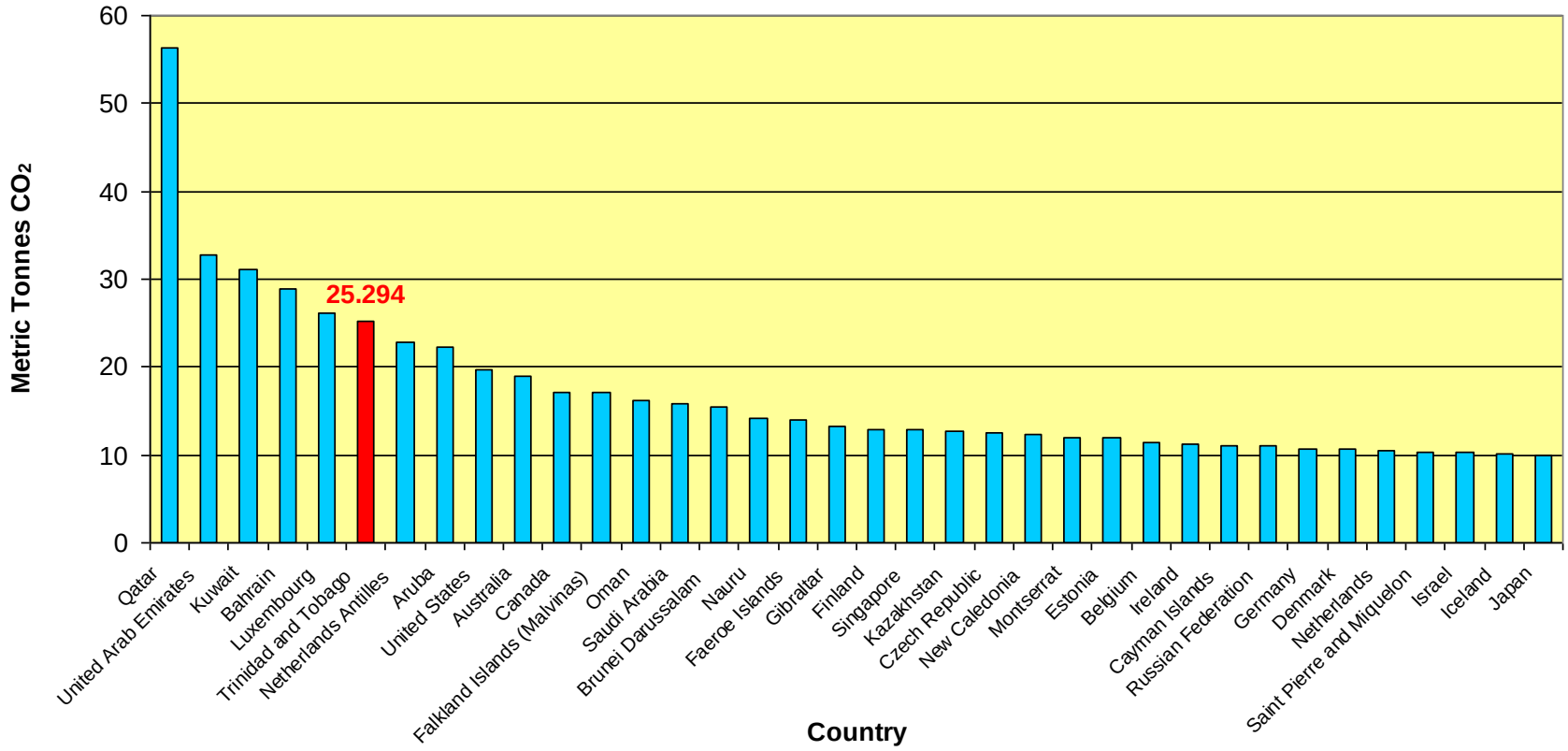


Figure 2.36: CO_2 emissions per person in Latin America and the Caribbean compared to world and OECD average emissions (T&T = 25 tonnes CO_2 per capita)

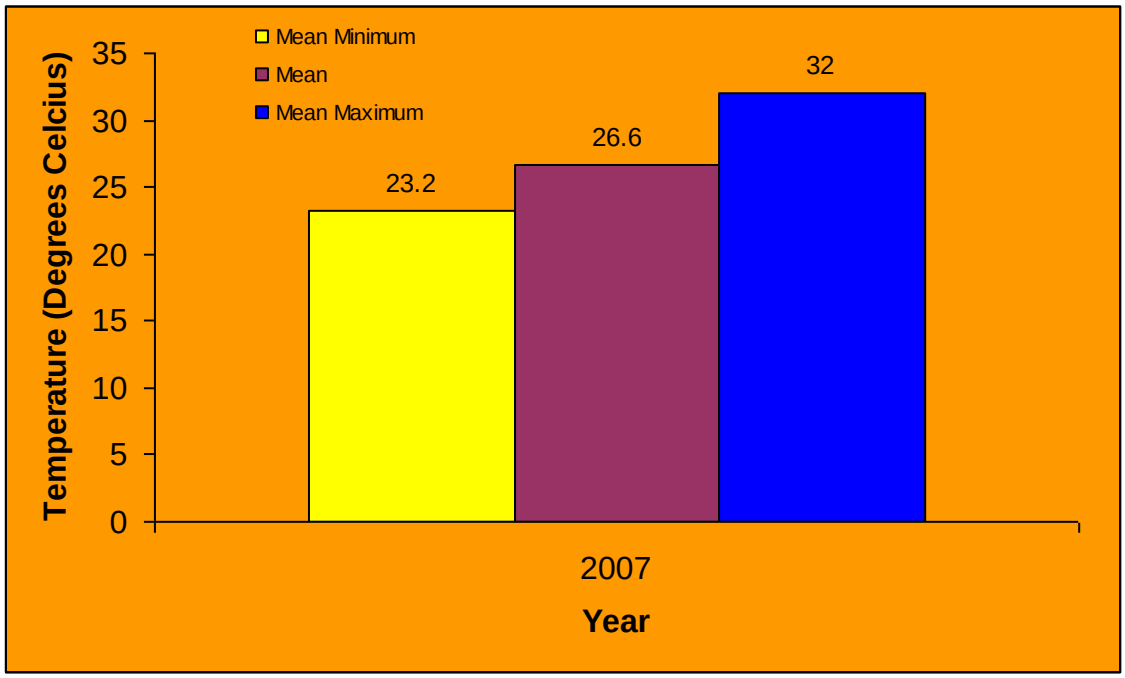


Source: United Nations Statistics Division, http://unstats.un.org/unsd/environment/air_co2_emissions.htm (Last Update August 2009)

Figure 2.37: Top 36 countries for per capita CO_2 emissions (metric tonnes of CO_2) in 2006

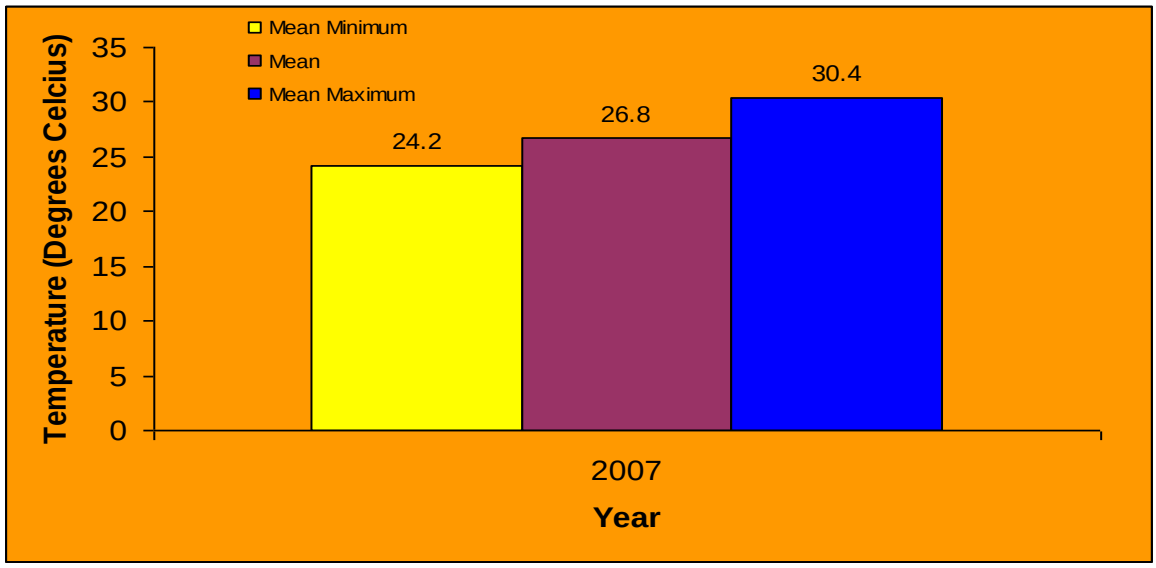
Figures 2.38 and 2.39 show the air temperatures recorded in Trinidad and Tobago (respectively) in 2007. Figure 2.40 shows the change in temperature in Trinidad between 1975 and 2007 indicates a continued overall increasing trend. Using linear regression, Trinidad's ambient temperature appears to have increased from approximately 26.5^{o}C in 1975 to approximately 27.9^{o}C in 2007 – a difference of about 1.4^{o}C. This increase is well in keeping with information from IPCC which reports a warming of between 0^{o}C and 0.5^{o}C per decade between 1971 and 2004 in the Caribbean region (Trenberth et al 2007).

The IPCC estimates that the total annual temperature increase in the Caribbean at the end of the 21st century (when compared with the start of the century) will be between 1.4^{o}C and 3.2^{o}C (Christensen et al 2007). It has also been reported by the IPCC that within any one (1) year, the number of days with higher minimum and maximum temperatures have increased significantly since the 1950's, and the number of days with cooler temperatures has decreased (Peterson et al, 2002 in Mimura et al 2007). The overall picture is thus that Trinidad and Tobago will more than likely continue to experience increases in temperatures in the future.



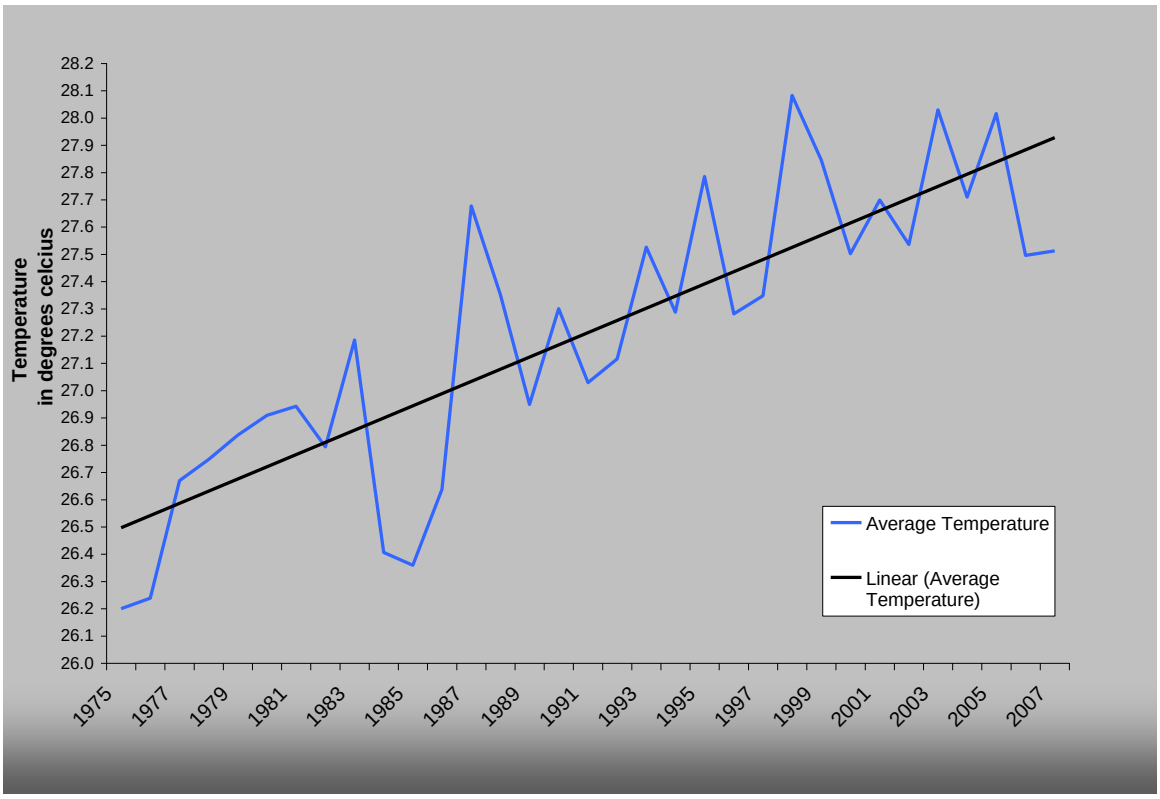
Source: Meteorological Services of Trinidad and Tobago 2008

Figure 2.38: Air temperature at Piarco, Trinidad (2006 and 2007)



Source: Meteorological Services of Trinidad and Tobago 2008

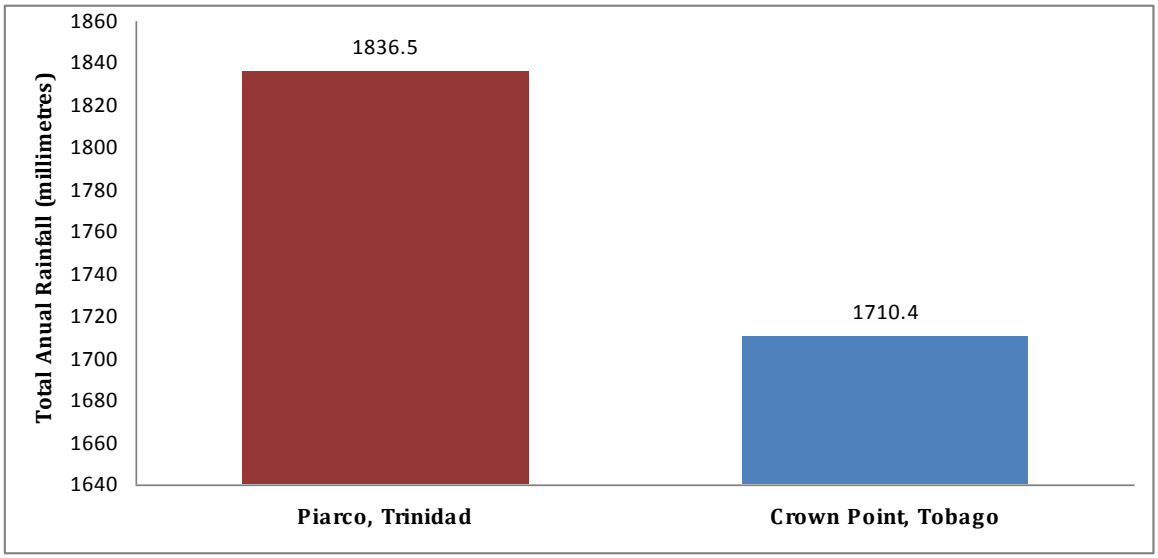
Figure 2.39: Air temperature at Crown Point, Tobago (2006 and 2007)



Source: Meteorological Services of Trinidad and Tobago 2008

Figure 2.40: Mean annual air temperatures in Trinidad (1975 – 2007)

Data and information on rainfall in Trinidad and Tobago for 2007 are shown in Figure 2.41. However, modelling undertaken by the IPCC indicates that the Lesser Antilles (including Trinidad and Tobago) may experience an increase in summer (equivalent to the period June-Aug) rainfall by the end of the 21st century (see Christensen et al 2007). Yet, because this modelling was undertaken using a limited dataset from Trinidad and Barbados, this finding has been presented with low certainty and confidence.



Source: Meteorological Services of Trinidad and Tobago 2008

Figure 2.41: Total annual rainfall in Trinidad and Tobago (2007)

There has been speculation regarding the effects of global warming and the climate change, and anthropogenic contribution to these processes. Although not directly related to Trinidad and Tobago, it is important and relevant in the context of the current ASOE to highlight some of the main findings published by the IPCC based on its fourth global assessment[17]:

- Firstly, it was found that greenhouse gas (GHG) emissions due to human activities have grown since pre-industrial time, with an increase of 70% on a global scale between 1970 and 2004;

[17] Only selected findings are included in this ASOE. Full findings of the IPCC could be found at the IPCC website http://www.ipcc.ch/ipccreports/assessments-reports.htm.

- Secondly, warming of the climate system is unequivocal as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level;

- Thirdly, observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases;

- Finally, small islands, whether located in the tropics or higher latitudes have characteristics which make them especially vulnerable to the effects of climate change, sea level rise and extreme events.

Based on official statements made by the IPCC (2007), which arose out of discussions and negotiations between the governments and scientists which comprise IPCC, it was concluded that:

- Most of the observed increase in global temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations. It is likely that there has been significant anthropogenic warming over the past 50 years averaged over each continent except Antarctica;

- Anthropogenic warming over the last three(3) decades has likely had a discernable influence at the global scale on observed changes in many physical and biological systems;

- Human influences have:

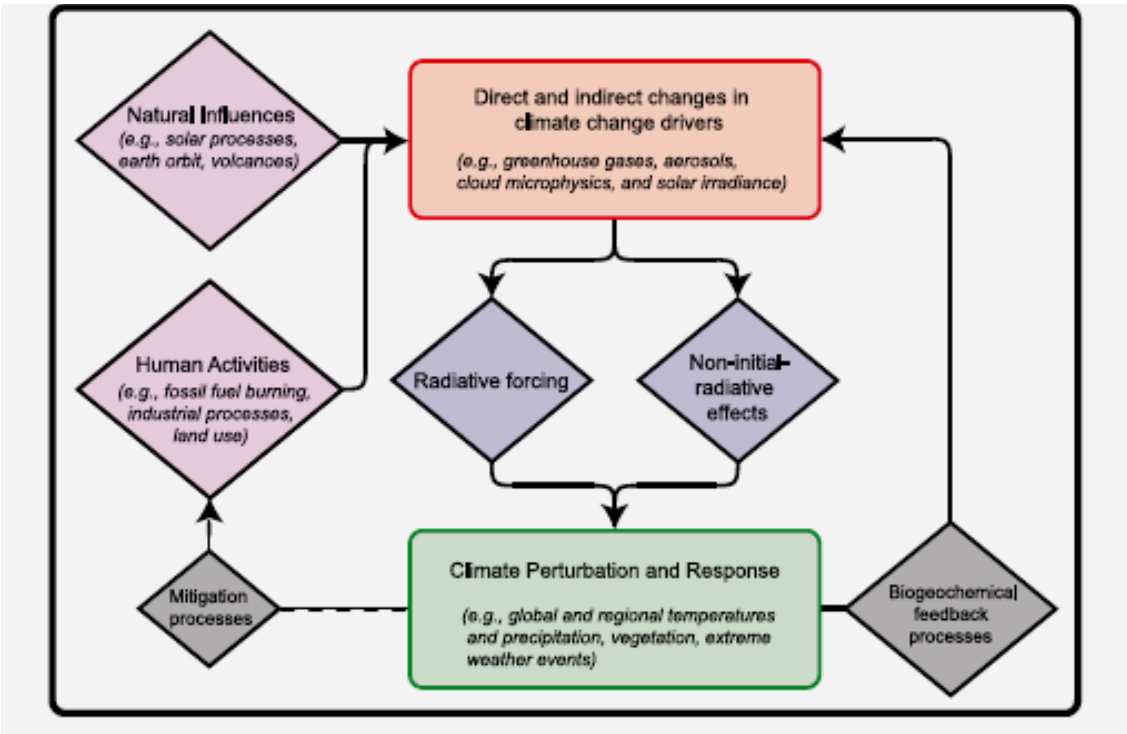
  - Very likely contributed to sea level rise during the latter half or the 20th century;

  - Likely contributed to changes in wind patterns, affecting extra-tropical storm tracks and temperature patterns;

  - Likely increased temperatures of extreme hot nights, cold nights and cold days;

  - More likely than not increased risk of heat waves, area affected by drought since the 1970s and frequency of heavy precipitation events.

There is thus diminishing speculation about whether humans are contributing to the global warming process, and Figure 2.42 conceptually shows how human activities are a part of the climate change process.



Source: Forster et al 2007

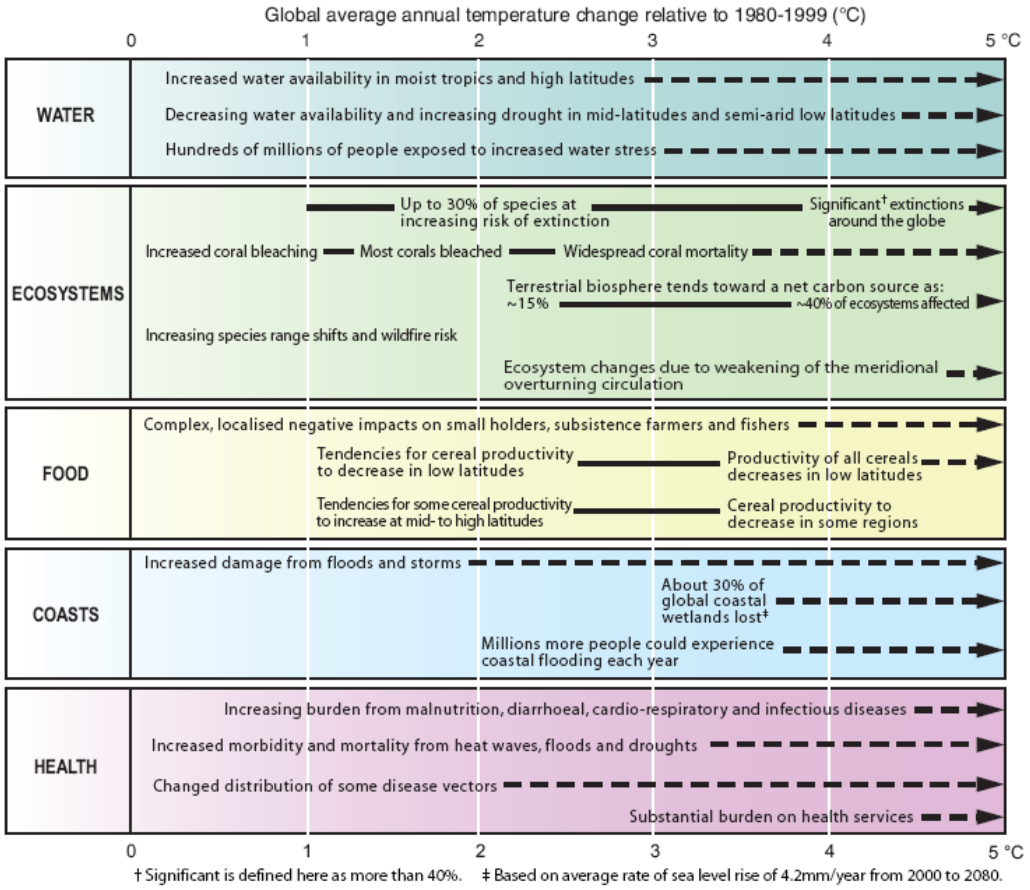
Figure 2.42: Components of the climate change process

Based on IPCC's work, Figure 2.43 shows some of the impacts which are associated with global average temperature, but it should be noted that impacts will vary from one place to another based on factors such as extent of adaptation, rate of temperature change and socio-economic pathways (IPCC 2007).

Small island developing states (SIDS) such as Trinidad and Tobago are anticipated to be especially vulnerable to climate change and its impacts. The major impacts on SIDS include (Mimura et al 2007):

- Sea level rise, which is expected to 'exacerbate inundation, storm surge, erosion, and other coastal hazards, thus threatening vital infrastructure, settlements and facilities that support the livelihood of island communities';
- Increasing scarcity of water resources;
- Impacts to fisheries, and other marine-based resources;

- Replacement of local species (changes in biodiversity);
- Adverse effects on subsistence and commercial agriculture;
- Negative direct and indirect changes on tourism;
- Impacts on human health.

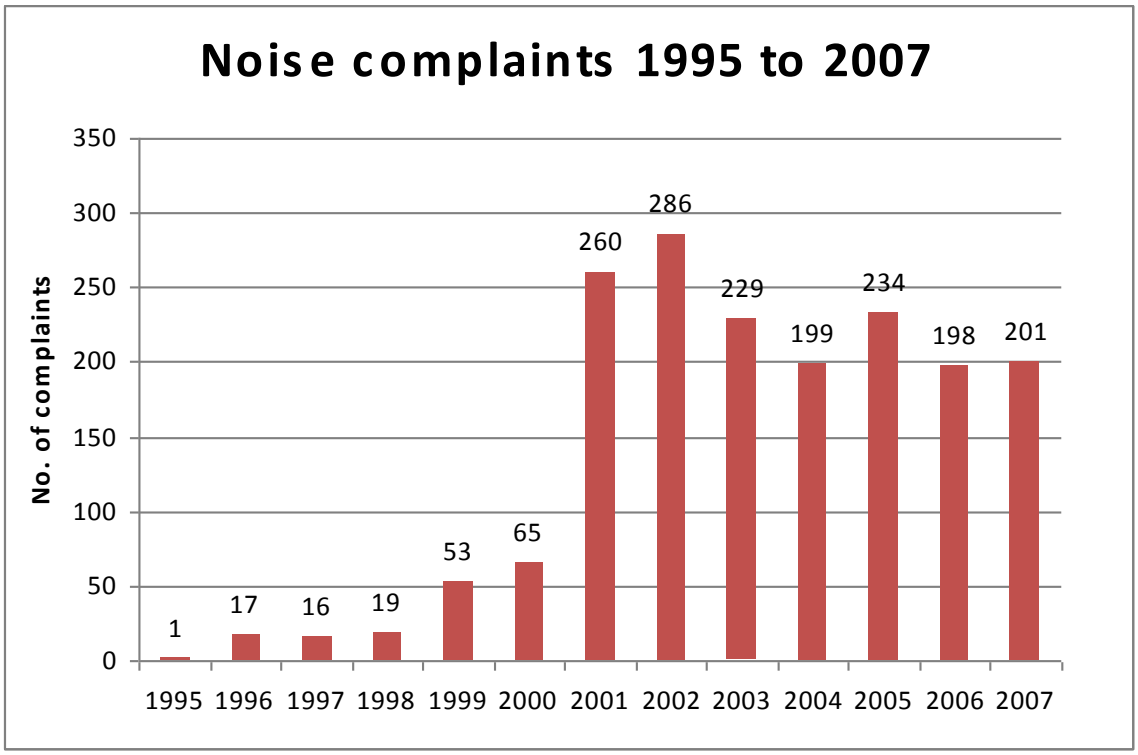


Source: IPCC 2007

Figure 2.43: Examples of impacts associated with global average temperature change

2.4 Noise Pollution

Data from the EMA on the number of noise complaints received in 2007 (Figure 2.44) indicate that there was a slight increase in noise complaints between 2006 and 2007 but this does not indicate a trend in the data.

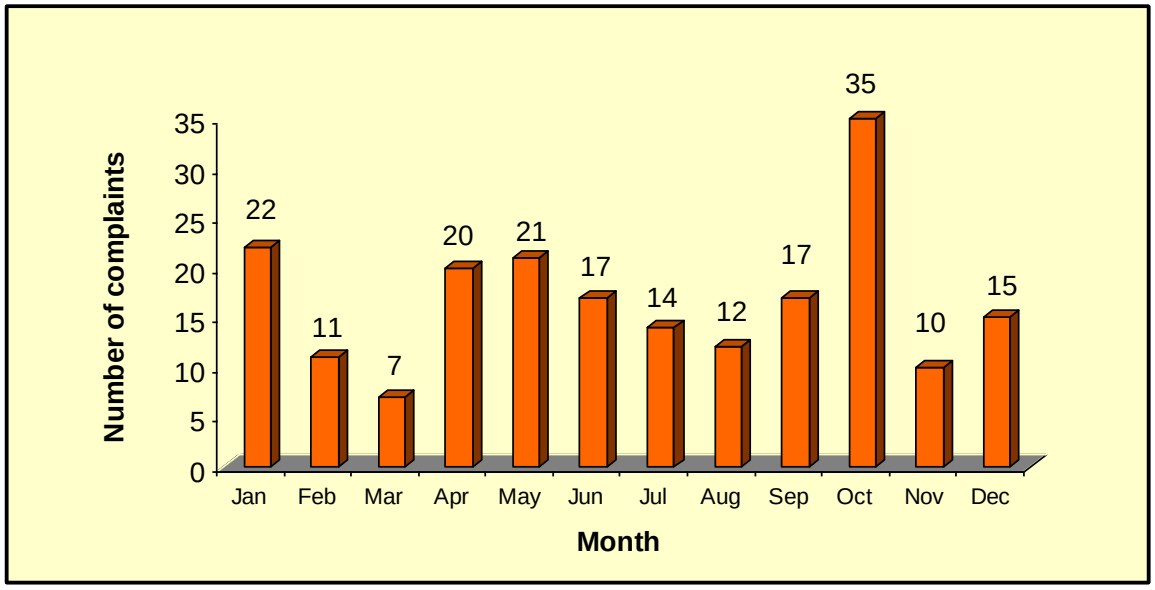


Source: Environmental Management Authority 2008

Note to graph –data for 2005 were calculated using 2004 and 2006 datasets and are thus presented with relatively lower scientific certainty than that for other years

Figure 2.44: Number of noise complaints received by the EMA for Trinidad and Tobago (1995 – 2007)

In 2007, the majority of noise complaints appear to have been made in October (Figure 2.45). The remainder of the year showed no expected seasonal trend in noise complaints, perhaps indicating that noise problems experienced by the population are not primarily related to seasonal entertainment and religious events but to perennial sources like bars and industrial activities.



Source: Environmental Management Authority 2008

Figure 2.45: Noise complaints received on a monthly basis in Trinidad and Tobago (2007)

3.0 Legal and Policy Framework for Environmental Management in Trinidad and Tobago

There are a number of legal instruments already enacted in Trinidad and Tobago to help promote sustainable development through, *inter alia*, more effective management of the environment. Several of these instruments are outdated and much of the legislation, though enacted, is not being properly enforced. The overall effect is that legal measures introduced to manage the environment are collectively not achieving the goals for which they have been established.

In 1999, the EMA undertook to review and assess the status of environmental legislation in Trinidad and Tobago – this was published as the national ASOE for 1999. However, since that time, there have been no published assessments of the status and effectiveness of the full range of national environmental legislation, except where, in certain cases, selected issues have been covered in detail. A recent example is the review of plans and policies which address water pollution (Table 3.1) which was undertaken as part of the preparatory work towards the development of a NPA (2008 – 2013).

However, it is clear that more effort needs to placed on undertaking a review and assessment of national legislation and plans on a more systematic and systemic basis.

Table 3.1: National plans and policies which seek to address water pollution problems in Trinidad and Tobago[18]

Issues	Plans/ Policies which Address Issues									
	NWRMP	NEP	DNSP	FDSPFD	NAP	DHDP	NBSAP	PFD	NWP	WWMPTT
Urban development including Industrial and Resort Development										
Deforestation of watersheds										
Wetlands loss										
Reclamation of inter-tidal areas										
Solid and Hazardous Wastes										
Quarrying										
Sewage										
POPs										
Nutrients										
Litter/Solid Waste										
PADH										

Source: IMA and UNEP 2008 Unpublished

NWRMP – National Water Resource Management Policy 2003; NEP – National Environmental Policy; DNSP – Vision 2020 Draft National Strategic Plan 2005; FDSPFD – Final Draft Strategic Plan of the Forestry Division 2005 - 2009: NAP – Draft National Action Programme to Combat Land Degradation in T&T; DHDP – Draft Hillside Development Policy 2006; NBSAP – National Biodiversity Strategy and Action Plan; PFD – 1999 Policy of the Forestry Division; NWP –National Wetlands Policy 2002 ; WWMPTT – Water and Wastewater Master Plan for Trinidad and Tobago.

3.1 National Environmental Policy 2006

Section 18 of the EM Act, called for the development of an NEP which would help define the specific measures required to promote environmental management in Trinidad and Tobago. First developed and laid in Parliament in 1998, it was necessary to revise the

[18]This publication did not make reference to the National Physical Development Plan.

NEP in order to keep pace with the rapid development and industrialization occurring in the country. The NEP was therefore revised and approved by the Minister in 2006[19].

The specific objectives of the NEP are given as follows:

a) Prevent, reduce or where possible recycle all forms of pollution to ensure adequate protection of the environment and consequently the health and well-being of humans;

b) Conserve the vitality and diversity of the natural environment through the conservation of ecological systems and the biodiversity within;

c) Develop within the carrying capacity (the assimilative capacity of the environment) of the country through national physical development and planning; and the sustainable use of renewable resources and the conservation of non-renewable resources;

d) Change attitudes and practices of citizens with a view to reducing the polluting practices of the public;

e) Ensure that all industries install a certified Environmental Management System;

f) Empower stakeholders, including communities to care for their own environments by providing opportunities to share in managing their local resources and the right to participate in decision making;

g) Promote the integration of the principles of environmental sustainable development into all country policies and programmes.

To realize the above-stated objectives a number of very specific actions have been outlined for all major areas of environmental management (all of which are included in the NEP). In many ways, the NEP can be considered ambitious, but the delineation of objectives into specific actions is very useful to help guide priorities and progress.

As at 2007, it is evident that many of the actions still required further attention and action. There was evidently more progress made on certain issues (such as Environmentally Sensitive Areas and Environmentally Sensitive Species, Ozone-Depleting Substances, Noise Pollution for example) when compared with others (for

[19] The NEP (2006) is available at http://www.ema.co.tt/cms/images/stories/pdf3/nep_19sep05.pdf

example issues like Air Pollution, Motor Vehicle Emissions and GHGs). It is imperative that more attention be placed on dealing with a wider range of issues identified in the NEP in order to promote more sustainable use of the country's resources.

3.2 Environmental Management Act, Chapter 35:05

The United Nations Conference on Environment and Development held in Rio de Janeiro in 1992 (also commonly known as The Earth Summit) gave impetus to the development of a national strategy for sustainable development in Trinidad and Tobago. Prior to this time, a number of pieces of legislation relating to the environment existed in the country, but it was recognised that there were several deficiencies with these. Firstly, many (individual) laws were not being effectively enforced, either due to a lack of appreciation of the importance of such laws, or the lack of funding and capacity required to bring about effective action. Secondly, a coherent framework for implementing and enforcing these laws did not exist, and so efforts where they existed, were largely fragmented. Thirdly, with the growing challenges to sustainable development being faced by the country, the laws, neither individually nor collectively, were sufficient to address the number, scale or complexity of driving forces (sometimes referred to as pressures, including both human induced and natural) being placed on the environment. In part, it was felt that the laws were dealing with issues in general, abstract, and often speculative terms, and it was recognised that more specific understanding and actions were required[20].

In the wake of the 1992 Summit, the Government realized that improving environmental management in Trinidad and Tobago would require **thinking strategically but acting specifically**. The challenge was therefore designing a framework which would be comprehensive yet simple, and which would create the space and context for including a multiplicity of actors and actions. Emerging out of local efforts to address this challenge was the enactment of the Environmental Management Act No.3 of 1995, under which, in June 1995, the EMA was established. Five(5) years after first introducing this piece of legislation, on 8th March 2000, the 1995 Act was repealed and re-enacted as the

[20] More information on environmental laws is provided in the 1999 State of the Environment Report available on the EMA's website at http://www.ema.co.tt/docs/techServ/SOE/1999_SOE.pdf; from the Ministry of Legal Affair's website http://rgd.legalaffairs.gov.tt/Laws/main.html; from the First Compendium of Environmental Statistics for Trinidad and Tobago compiled by the Central Statistical Office available at http://www.cso.gov.tt.

Environmental Management Act No. 3 of 2000. Following a revision of the Laws of Trinidad and Tobago in 2006, this Act is today referred to as the Environmental Management Act Chapter 35:05[21] (EM Act).

The Environmental Management Act Chapter 35:05 (hereafter referred to as the EM Act) is an umbrella-type piece of legislation which provides a framework for managing the environment in Trinidad and Tobago. It is to date the most integrated and holistic piece of environmental legislation in the country, allowing for a more scientific and pragmatic approach to regulation, and monitoring and evaluation of activities with a potential environmental impact. But this does not mean that the EM Act is the only environmental law in the country, and to be most effective, it must work alongside several other laws and policies to promote sustainable use.

The EM Act guides the work of the EMA by establishing guidelines for achieving a set of specific and general goals. The stated objectives of the Act (Section 4) are to:

1. Promote and encourage among all persons a better understanding and appreciation of the environment;

2. Encourage the integration of environmental concerns into private and public decisions;

3. Ensure the establishment of an integrated environmental management system in which the Authority, in consultation with other persons, determines priorities and facilitates coordination among governmental entities to effectively harmonise activities designed to protect, enhance and conserve the environment;

4. Develop and effectively implement written laws, policies and other programmes for and in relation to:

    a. The conservation and wise use of the environment to provide adequately for meeting the needs of present and future generations and enhancing the quality of life;

    b. The Government's commitment to achieve economic growth in accordance with sound environmental practices;

[21] A copy of the Environmental Management Act 2000 is available on the EMA's website at http://ema.co.tt/docs/legal/cur/Act_3_of_2000.pdf , and can also be accessed through the EMA's library located at #8 Elizabeth Street, St. Clair, Port of Spain.

c. The Government's international obligations; and

5. Enhance the legal, regulatory and institutional framework for environmental management.

The EMA has been putting in place several measures to ensure that all of these objectives are realized. In its Strategic Plan 2003 -2008[22], the EMA set out five (5) Strategic priorities which are:

- Clean Air
- Clean Water
- Waste Management
- Noise Management
- Healthy Ecosystems

In order to address these priorities and meet the targets set out in the Strategic Plan, the last few years have seen significant emphasis for allocation of financial resources and human capacity within the EMA being placed on developing, implementing and enforcing legislation of a regulatory nature.

Under Part Five (V) of the EM Act, the EMA has so far implemented five (5) pieces of subsidiary legislation (or Rules) and has in draft form, two(2) additional proposed Rules which are expected to be implemented in the next few years. General information on these Rules, including their current implementation status, is provided in Table 3.2.

[22] See http://www.ema.co.tt/docs/aboutus/tsp.doc

Table 3.2: Selected information on the subsidiary and proposed legislation under the EM Act

Rule	Applicable Section(s) of the EM Act	Date of Enactment	Date of Amendment (where applicable)
Environmentally Sensitive Species Rules 2001	41 - 44	25th April 2001	Not applicable
Noise Pollution Control Rules 2001	49 and 51(2)	22nd February 2001	Not applicable
Environmentally Sensitive Areas Rules 2001	41 - 44	27th February 2001	Not applicable
CEC Rules 2001 CEC (Designated Activities) Order 2001	35 - 37	13th June 2001	Amendment to CEC Designated Activities Order 27th August 2007
Water Pollution Rules 2001	52 - 54	11th July 2001	Amendment to Fees on 26th December 2006 Amendment to Rules on 17th January 2007
(Draft) Air Pollution Rules 2001	49, 50, 51(1)	Pending	Not applicable
(Draft) Waste Management Rules 2008	55 - 58	Pending	Not applicable

In keeping with the paradigm of thinking strategically but acting specifically, the various pieces of legislation developed or being developed under the EM Act address separate issues (for example, water pollution, air pollution, environmentally sensitive species etc.). And with the exception of the CEC Rules 2001 (which might best be described as cross-cutting), it is clear that there is a one-on-one fit between each of these Rules and the strategic priorities (2003 – 2008) of the EMA:

- Clean Air – *Draft Air Pollution Rules*
- Clean Water – *Water Pollution Rules*
- Waste Management – *Draft Waste Management Rules*
- Noise Management – *Noise Pollution Control Rules*

- Healthy Ecosystems – *Environmentally Sensitive Areas (ESA) and Environmentally Sensitive Species (ESS) Rules*

The approach of dealing with a discrete issue under each of the Rules is advantageous to the extent that each of the Rules allows for a more focused and in-depth examination of a specific issue or problem in a specific context, and this can improve the overall efficiency of decision-making in that context. Yet, this does not diminish the importance of recognizing that each of these Rules forms part of a larger, integrated package, and dealing with an environmental problem might sometimes require that cross-referencing across Rules occurs.

Figure 3.1 attempts to show the conceptual differences and linkages between the issues covered by each of the Rules. Again, with the exception of the CEC Rules, all other Rules could be divided into two major blocks for representational purposes – Biodiversity (including the ESA and ESS Rules) and Direct Environmental Impacts (including water pollution, waste management, air pollution and noise pollution). It should be noted however that the categorization shown in Figure 3.1 is not absolute – there are a number of permutations and combinations that could potentially be formed from the EMA's legislative package – but for the purpose of this document, it makes the most sense.

Within the block on Biodiversity, there is very strong overlap between the ESA and ESS Rules because of their shared scope and objectives – protecting biodiversity at all levels. Within the block on Human Impacts, the strength of the overlap between the rules differs. Water pollution is for example in no way related to Noise Pollution in its scope. There is an association between Air Pollution and Noise Pollution because of the environmental medium under consideration (the atmosphere). Waste (solid and hazardous) can be linked to both water pollution and air pollution.

Between the two boxes (Biodiversity and Human Impacts), any combination of linkages between Rules can potentially exist. These linkages, shown as green lines, are the linkages which sometimes require that cross-referencing between Rules takes place. But the actual nature of any one of these relationships, and the consideration given to them by the EMA is very case specific.

The CEC Rules, as indicated earlier, are a special case when compared with the other Rules, in that the CEC Rules do not deal with the consideration of a specific issue or problem. Rather, these Rules have been put in place to help regulate proposed development activities which can have one, or any number of effects on the environment and human health. As such, the CEC Rules are best seen as cross-cutting, and are the Rules for which most cross-referencing with other Rules occur.

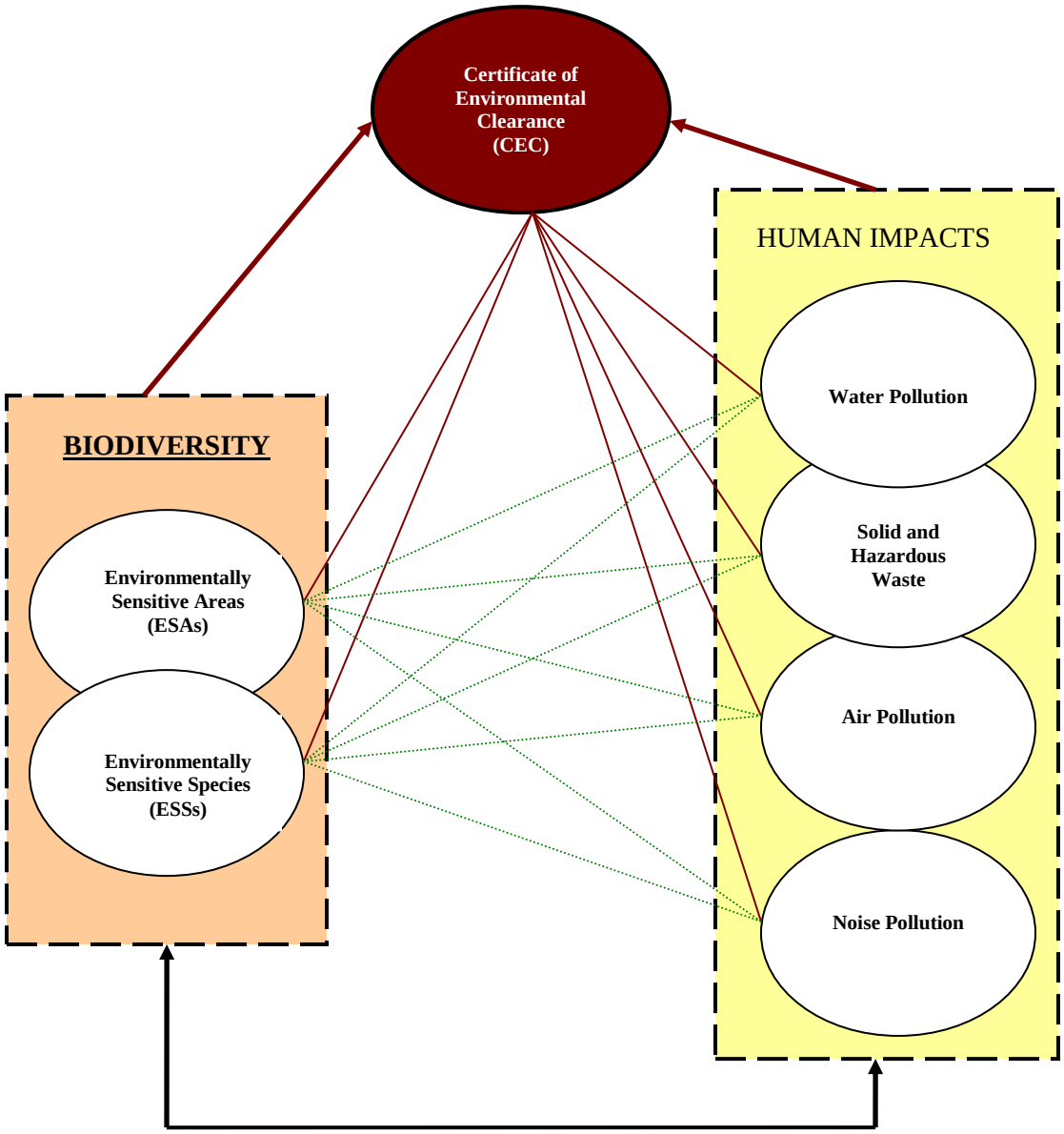


Figure 3.1: Conceptual interlinkages between the subsidiary and proposed legislation under the EM Act

The Following sections of this chapter will seek to provide:

1. More information on the CEC Rules, including update CEC statistics.
2. Information on the Water Pollution Rules.
3. An update on the Draft Air Pollution Rules.
4. Updated information on advancements under the ESA and ESS Rules.

3.3 The Certificate of Environmental ClearanceRules

The CEC Rules, 2001 were established by the EMA under section 26(h) and after compliance with sections 27 and 28 of the EM Act. The CEC (Designated Activities) Order, as amended, made under section 35(1) includes a total of 44 very specific development activities (designated activities) for which a CEC is required. These designated activities are listed and described in the schedule to the CEC Rules (Designated Activities) Order, 2001 which accompanies the CEC Rules[23] and for simplicity, can be broken down into 17 broad categories as given by the NEP (Table 3.3).

TABLE 3.3: BROAD CATEGORIES OF ACTIVITIES REQUIRING A CEC

Agriculture/horticulture
Electricity generation, transmission and distribution
Engineering operations
Food and beverage industry
Heavy manufacturing industries
Light manufacturing industries
Metal smelting and reforming
Mineral mining and processing
Oil and gas exploitation
Telecommunications
Tourism and recreational development
Transport system infrastructure
Waste management
Water and sewage systems
Storage and warehousing
Other service-oriented activities
Land reclamation

[23] A copy of the CEC Designated Activities Order can be found at: http://www.ema.co.tt/docs/legal/sub/Certificate%20of%20Environmental%20Cleareance%20(Designated%20Activities)%20Order.pdf

The CEC Rules specify a series of steps which must be followed and criteria which must be met in the consideration of all CEC applications, and Figure 3.2 provides a general outline of the major steps in the CEC process. Yet, having developed a process to guide the work does not mean that a cookie-cutter approach is used to determine whether a CEC should be granted or not. The CEC process provides the necessary framework for the assessment of CEC applications, but each application would contain a set of issues, circumstances and considerations which makes it different from other applications. For example an application for an aluminium smelter (on land) would differ from an application for the development of an exploratory gas well off the east coast of Trinidad. In every case therefore, the EMA cross-checks each CEC application with the other Rules (under the EM Act), guidelines and standards to ensure that all proposed activities will be within stipulated limits and requirements (air, water, noise, waste), and the EMA also identifies whether the proposed activities will have a significant impact on sensitive ecosystems (ESAs and ESSs).

Environmental Impact Assessments in the context of the CEC process

One important step which may be required in the CEC process, as shown in Figure 3.2, is the submission of an environmental impact assessment (EIA)[24]. The International Association for Impact Assessment (IAIA) (2009) defines an EIA as 'the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made.

Environmental Impact assessments were introduced to Trinidad and Tobago as a standard requirement of the project and planning approval process even before the implementation of the CEC Rules in 2001, and they have remained an extremely important tool within the CEC process to date. The CEC process tries to achieve several specific objectives related to EIAs, and these are as follows:

a. To reach a common understanding and agreement on the principles and application of EIA;

[24] See http://www.ema.co.tt/docs/techServ/eias.pdf for a listing of EIAs received by the EMA.

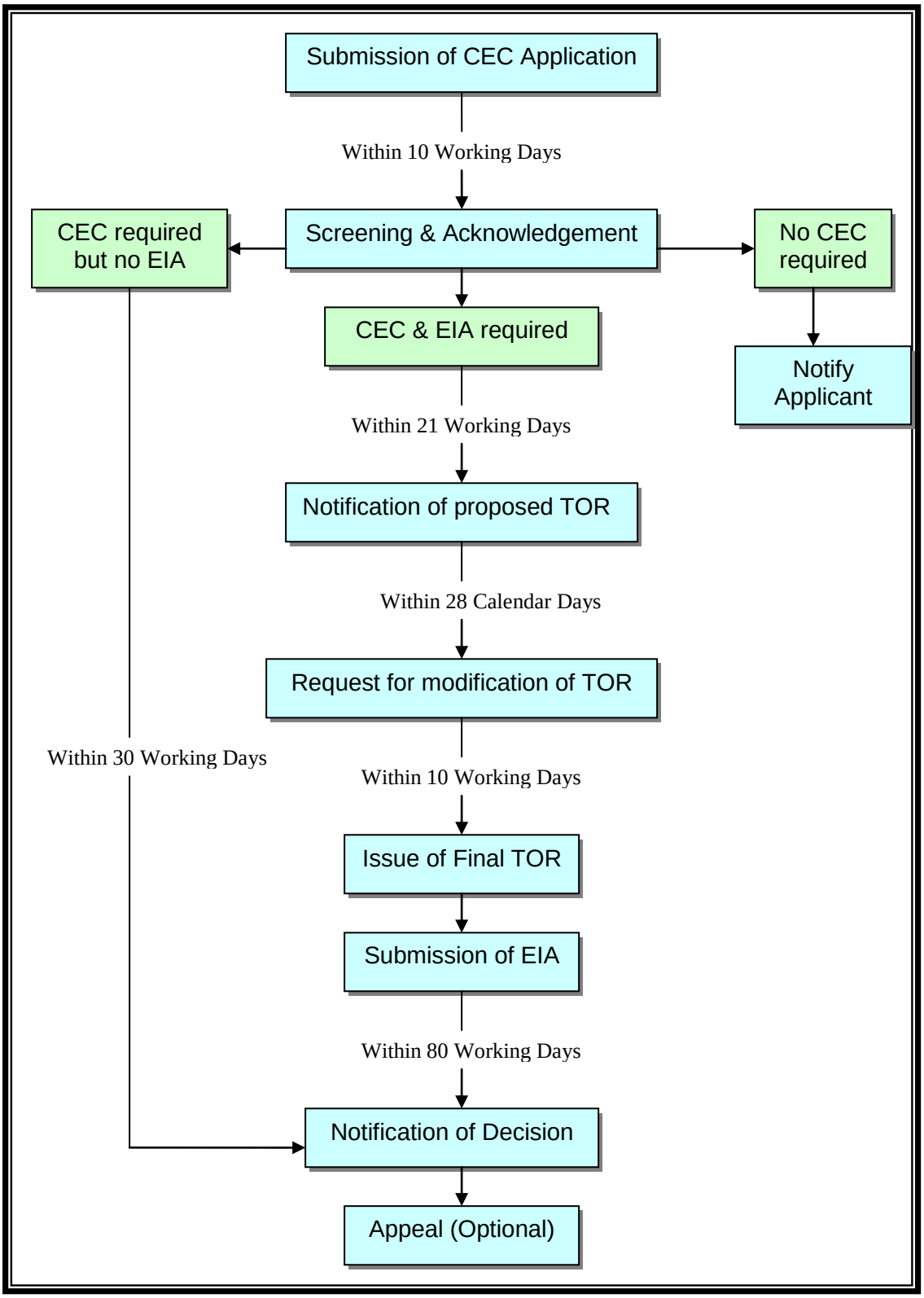


Figure 3.2: Certificate of Environmental Clearance process flowchart diagram

b. To improve the EIA process so that its scope of review is consistent with the nature of the proposal and commensurate with the likely issues and impacts;

c. To promote public awareness and to provide and facilitate opportunities for the public's involvement;

d. To avoid duplication where multiple jurisdictions are involved; and

e. To identify and apportion responsibilities for participants in the EIA process

If a CEC application requires an EIA to be conducted, a Terms of Reference (TOR) is developed in consultation with the applicant. When the EIA is submitted to the EMA, it undergoes a preliminary review, which is based on a checklist, after which it is either deemed to be acceptable for further processing, or is returned to the applicant to address the omissions from the document. The CEC decision can be granted within an 80 working day period from the date the EIA is accepted. If the EIA is accepted for further processing, a more in-depth review is undertaken by a review team comprised of stakeholders from Government ministries, non-governmental organizations and regulatory agencies e.g. the Town and Country Planning Division (TCPD), Occupational Safety and Health Agency (OSHA), Fisheries Division, Ministry of Works and Transport, the Ministry of Energy and Energy Industries, the Archaeological Committee, Regional Corporations, the Fires Services Division, and the Maritime Services Division. Where the expertise to review special areas of the EIA is not resident at the EMA, the services of private specialist consultants are retained.

Parallel to this review process is the Public Comment period, during which the document is lodged at specified locations in T&T for public scrutiny and comment. The comments are screened by the review team and those deemed to be of relevance are integrated with those of the team, to produce a Review and Assessment Report (RAR).

The RAR contains three categories of comments: -

- Critical – must be addressed to the satisfaction of the EMA and provides information for the CEC determination;

- Supplementary – identifies issues that should be addressed if the EIA is to be considered complete, but will not affect the CEC decision;

- General – included for the benefit of the applicant and contains comment to note from the Review Team.

The response by the applicant to the RAR is further reviewed and, if deemed necessary by the EMA, may be put out for public comment.

Possible Outcomes of the CEC Process

As given under Section 36 (1) & (2) of the EM Act, there are two (2) possible (final) outcomes of CEC process:

- Once the EMA deems that all the potential impacts associated with a proposed development have been managed to acceptable levels, a Certificate is issued by the EMA to the applicant. The relevant CEC stipulates the conditions under which the development activity being proposed by the applicant can proceed;
- The EMA refuses to grant a Certificate, providing reasons in writing for its decision.

Once a CEC is issued, the EMA and the proponent then both have a shared responsibility to monitor and regulate the ongoing activities of the operation to ensure that the conditions intended to protect the environment and public health are met.

The 2007 amendment to the CEC (Designated Activities) Order

In 2007, a significant change to the CEC Rules was made. The CEC (Designated Activities) Order, which lists and describes the 44 activities regulated by the CEC Rules, was amended by the then Minister of Public Utilities and the Environment under Activity 23 - the 'Establishment of a facility for non-metallic mining and processing', more commonly known as quarrying. Since the amendment, 'the establishment, modification, expansion, decommissioning or abandonment (inclusive of associated works) of a facility for the mining, processing, or storage of clay, andesite, porcellanite, limestone, oilsand, sand(s), gravel or other non-metallic minerals' only now requires a CEC if the facility occupies an area that is 150 acres or greater. With this amendment, quarry activities on land area smaller than 150 acres could only be regulated by the EMA if they included any one (1) or combination of activities under Designated Activity 8:

a. The clearing excavation, grading or land filling of an area of more than two (2) hectares (4.94 acres) during a two (2) year period;

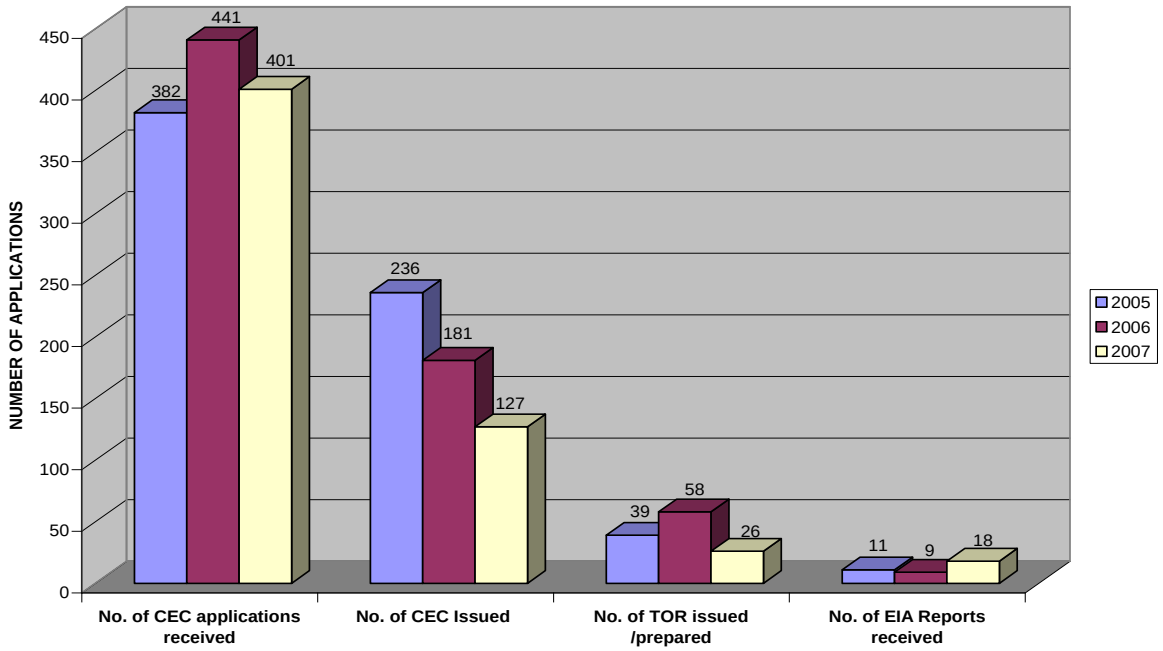
b. The clearing of more than half (1/2)a hectare (1.24 acres) of forested area during a 2 year period;

c. The clearing, excavation, grading or land filling of any area with a gradient of 1:4 or more.

The amendment to the CEC (Designated Activities) Order resulted in a reduction in the number of quarries requiring a CEC from the EMA.

Trends in CEC Applications

The number of CEC applications received by the EMA over the period 2005 to 2007, as well as some related statistics, is shown in Figure 3.3.



Source: Environmental Management Authority 2009

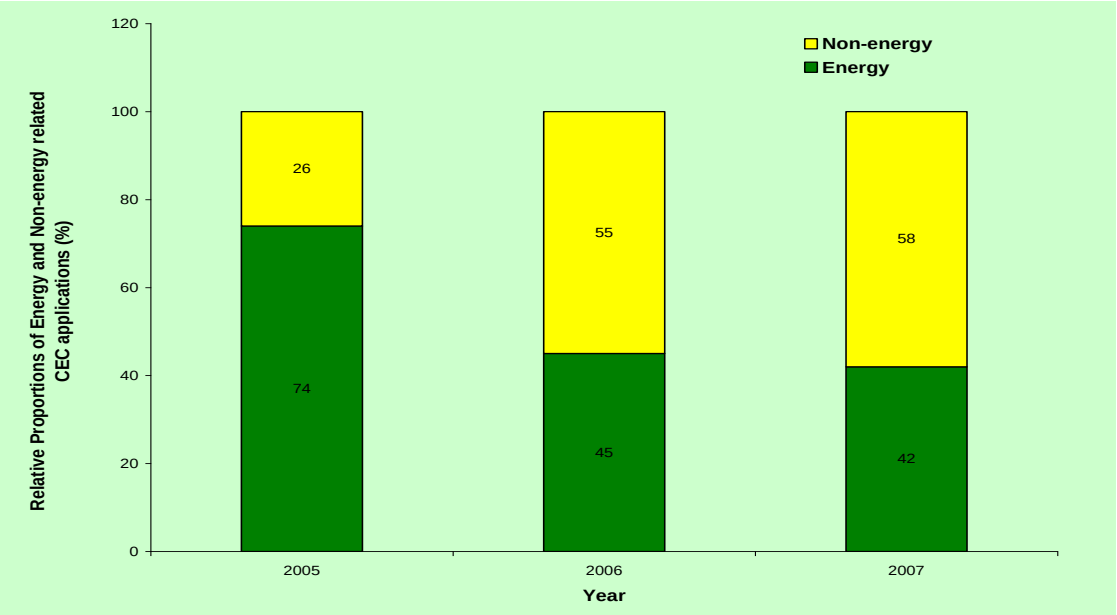
Figure 3.3: CEC applications received by the EMA and related statistics for the period 2005-2007

Interpreting CEC statistics is most effectively done in the context of an analysis of the state of Trinidad and Tobago's economy and the development goals of the country over the same period, although it should be noted that there may be other contributing factors which influence the CEC process and CEC statistics.

As previously discussed in Chapter 1, Trinidad and Tobago experienced accelerated development into 2007 arising out of the oil and natural gas windfall. There was, as a result, a significant expansion of activity in several sectors particularly related to energy and energy industries, and construction. In particular, the construction sector experienced what might be described as a "boom" with activities related to the expansion of road networks, upgrade of infrastructural and institutional facilities and accelerated housing programmes. There also appeared to be growth in activities related to agriculture and small and micro enterprises[25].

In what would appear to be in keeping with the pattern of economic growth in the country, the number of CEC applications received by the EMA increased from 382 in 2005, to 441 in 2006, and then decreased slightly to 401 in 2007 (Figure 3.3). An analysis of applications also showed that the number of CEC applications received for non-energy related activities were almost equal to those received for energy related activities in 2006 and 2007 (Figure 3.4).

[25] More information is available from: Central Bank of Trinidad and Tobago 2008. *2007 Annual Economic Survey*.Port of Spain, Trinidad. 136pp. http://www.central-bank.org.tt/publications/issues/aes1217361803.pdf



Source: Environmental Management Authority

Notes: Data for all years represent January to December

Figure 3.4: Relative proportions of energy and non-energy-related CEC applications by year (2005 – 2007)

3.4 The 'Water Pollution Rules'

The Water Pollution Rules 2001 as amended by The Water Pollution (Amendment) Rules 2006 (WPRs) were made by the then Minister of Public Utilities and the Environment under sections 26, 48, 52, 53 and 54 of the EM Act, and were implemented on February 27th 2007. These rules are intended to reduce the point source discharge of pollutants from facilities into inland surface waters, groundwater, and marine and coastal waters (including wetlands) so as to mitigate any harmful effects on the environment and/or human health. A total of 29 parameters or substances are regulated under the WPRs and the quantity, condition or concentration at which each of these substances is considered a pollutant is given in the First Schedule of the WPRs as shown in Table 3.4.

Table 3.4: Register of water pollutants under the Water Pollution Rules

Water Pollution Rules 2001 (as amended)—FIRST SCHEDULE (Rule 3) REGISTER OF WATER POLLUTANTS		
No.	**Parameters or Substances Units in mg/L or otherwise specified**	**Condition or Concentration at which substance or parameter is likely to cause harm to human health and the environment [a]**
	Temperature	Maximum variation of 3 ^{o}C from ambient
	Hydrogen ion (pH)	< 6 or > 9
	Dissolved Oxygen Content (DO)	<4
	Five day Biological Oxygen Demand (BOD_5 at 20^{o}C)	>10
	Chemical Oxygen Demand (COD)	>60
	Total Suspended Solids (TSS)	>15
	Total Oil and Grease (TO&G) or n-Hexane Extractable Material (HEM)	>10
	Ammoniacal Nitrogen (as NH_3-N)	>0.01
	Total Phosphorus (as P)	>0.1
	Sulphide (as S)	>0.2
	Total Residual Chlorine	0.2
	Chloride (Cl^-)	>250
	Dissolved Hexavalent Chromium (Cr^{6+})	>0.1
	Total Chromium (Cr)	>0.1
	Dissolved Iron (Fe)	>1.0
	Total Petroleum Hydrocarbons (TPH)	NIAA
	Total Nickel (Ni)	>0.5
	Total Copper (Cu)	>0.01
	Total Zinc (Zn)	>0.1
	Total Arsenic (As)	>0.01
	Total Cadmium (Cd)	>0.01
	Total Mercury (Hg)	>0.005
	Total Lead (Pb)	>0.05

Water Pollution Rules 2001 (as amended)—FIRST SCHEDULE (Rule 3) REGISTER OF WATER POLLUTANTS		
No.	**Parameters or Substances Units in mg/L or otherwise specified**	**Condition or Concentration at which substance or parameter is likely to cause harm to human health and the environment [a]**
	Total Cyanide (as CN^-)	>0.01
	Phenolic Compounds (as phenol)	>0.1
	Radioactivity	NIAA
	Faecal Coliforms	>100
	Toxicity	NATE
	Solid Waste	No solid debris
[a] all units are in milligrams per litre (mg/L) except for temperature (°C), pH (pH units), turbidity (NTU), faecal coliforms (counts per 100 ml), radioactivity (Bq/L) and toxicity (toxic units). NIAA—no increase above ambient NATE—no acute toxic effects >greater than <less than		

For each of the 29 parameters, the WPRs also stipulates the permissible levels in four(4) different receiving environments: inland surface waters, coastal nearshore, marine offshore and ESA and/or groundwater. These permissible levels are included in the Second Schedule of the Rules and are given in Table 3.5.

Table 3.5: Permissible levels of substances and parameters under the Water Pollution Rules

Water Pollution Rules 2001, (as amended)—SECOND SCHEDULE (Rule 8) PERMISSIBLE LEVELS					
	Water Pollutants	**Receiving Environment**			
No.	**Parameters or Substances**	**Inland Surface Water**	**Coastal Nearshore**	**Marine Offshore**	**Environmentally Sensitive Areas and/or Groundwater**
	Levels or Conditions[a]				
	Temperature	35	40	45	NIAA
	Dissolved Oxygen	>4	>4	>4	>4
	Hydrogen ion (pH)	6-9	6-9	6-9	6-9
	Five day Biological Oxygen Demand (BOD_5 at 20^oC)	30	50	100	10
	Chemical Oxygen Demand (COD)	250	250	250	60
	Total Suspended Solids (TSS)	50	150	200	15
	Total Oil and Grease (TO&G) or n-Hexane Extractable Material (HEM)	10	15	100	No discharge
	Ammoniacal Nitrogen (as NH_3-N)	10	10	10	0.1
	Total Phosphorus (as P)	5	5	5	0.1
	Sulphide (as S)	1	1	1	0.2
	Chloride (as Cl^-)	250	NIAA	NIAA	NIAA
	Total Residual Chlorine	1	1	2	0.2
	Dissolved Hexavalent Chromium (Cr^{6+})	0.1	0.1	0.1	0.05
	Total Chromium (Cr)	0.5	0.5	0.5	0.1
	Dissolved Iron (Fe)	3.5	3.5	3.5	1.0
	Total Petroleum Hydrocarbons (TPH)	25	40	80	No discharge

Water Pollution Rules 2001, (as amended)—SECOND SCHEDULE (Rule 8) PERMISSIBLE LEVELS					
	Water Pollutants	**Receiving Environment**			
No.	**Parameters or Substances**	**Inland Surface Water**	**Coastal Nearshore**	**Marine Offshore**	**Environmentally Sensitive Areas and/or Groundwater**
	Levels or Conditions[a]				
	Total Nickel (Ni)	0.5	0.5	0.5	0.5
	Total Copper (Cu)	0.5	0.5	0.5	0.01
	Total Zinc (Zn)	2	2	2	1
	Total Arsenic (As)	0.1	0.1	0.1	0.01
	Total Cadmium (Cd)	0.1	0.1	0.1	0.01
	Total Mercury (Hg)	0.01	0.01	0.01	0.005
	Total Lead (Pb)	0.1	0.1	0.1	0.05
	Total Cyanide (as CN^-)	0.1	0.1	0.1	0.01
	Phenolic Compounds (as phenol)	0.5	0.5	0.5	0.1
	Radioactivity	NIAA	NIAA	NIAA	NIAA
	Toxicity	NATE	NATE	NATE	NATE
	Faecal Coliforms	400	400	400	100
	Solid Waste	NSD	NSD	NSD	NSD

[a] all units are in milligrams per litre (mg/L) except for temperature (°C), pH (pH units), faecal coliforms (counts per 100 ml), radioactivity (Bq/L) and toxicity (toxic units)

NIAA—no increase above ambient

NATE—no acute toxic effects

NSD—No solid debris

> greater than

In 2007, facilities (industrial, commercial, agricultural, institutional and sewerage) that released or intended to release water pollutants into the natural environment, began registering with the EMA. All information provided by applicants is entered into a comprehensive database, and this allows for systematic monitoring and evaluation of facilities by the EMA. As at December 31st 2007, a total of 430 applications were received –402 in Trinidad and 28 in Tobago (Figure 3.5).

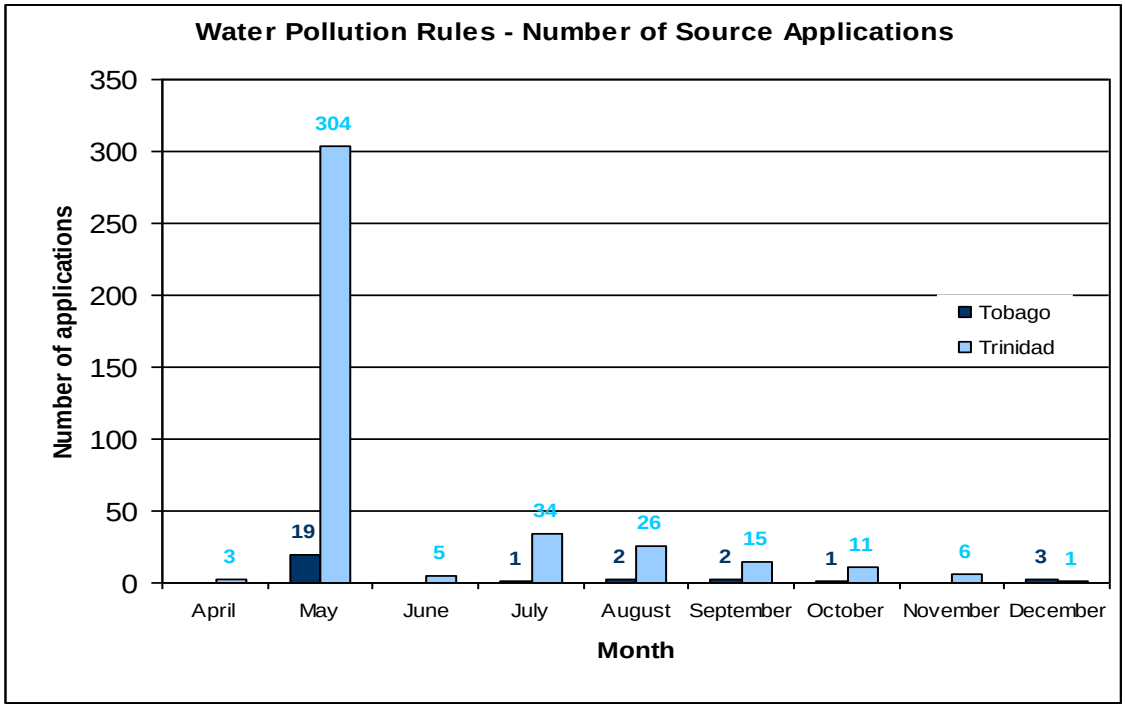


Figure 3.5: Number of source applications received under the Water Pollution Rules by month for Trinidad and Tobago (April to December 2007)

Amongst the data requested from each company is the geographic location (Universal Transverse Mercator Coordinates) of its facility/facilities, and the EMA uses this information to plot source registration applications onto a geographic information system (GIS) map. All data collected as of end December 2007 is shown in Figure 3.6.

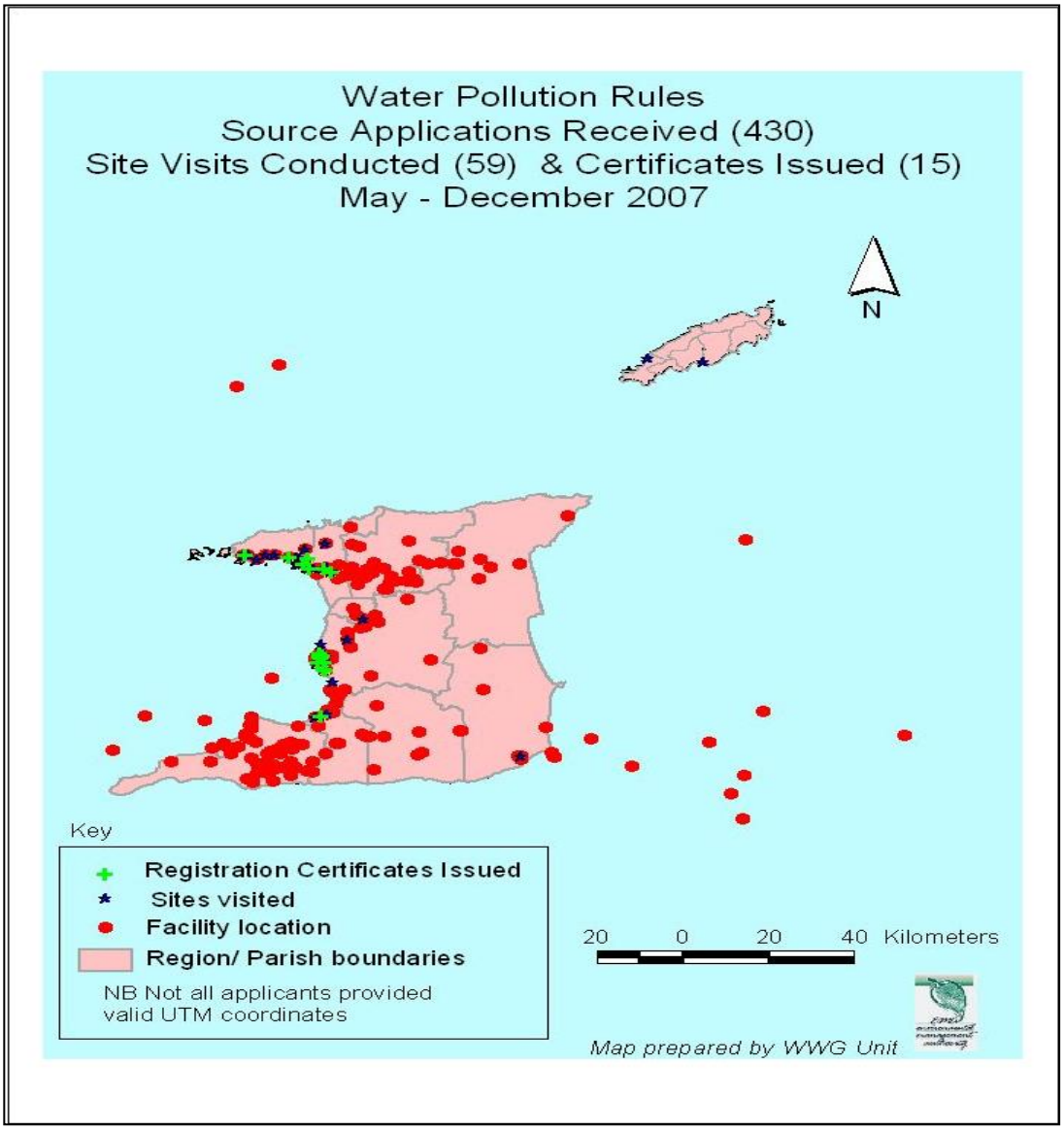


Figure 3.6: Map of Trinidad and Tobago showing Water Pollution Rules source applications received by the EMA as at December 2007

While the WPRs have been significant in transforming the approach to water pollution management in Trinidad and Tobago, it is important to note that the legislation only establishes "end-of-pipe" standards or technology-based standards for effluent. In order to fully achieve the objective of clean water, we must move towards establishing water quality based standards for the receiving environments identified. As the EMA moves ahead with the implementation of the WPRs, there are several issues which it will seek to address:

- The first issue, which the EMA is attending to, is the development of local point source water quality standards for Trinidad and Tobago. The EMA is mindful that current standards listed in Table 3.4 are a starting point, and the WPRs are being used to gather data from which more detailed industry-based standards will be developed;

- At present, the WPRs deal only with point source pollution from facilities and so they do not cover two main dimensions:

    - Ambient water quality issues. Ambient refers to the receiving environment in its totality, and in cases where several facilities in close proximity are discharging substances into (or have an impact on) a single receiving environment, it will be important to ensure that although they may each be discharging within the (point source) permissible limits stipulated, their collective action does not have an impact on the ecology. Though the EMA is not the principal entity to undertake this research, it will work with other partners in the development of such standards;

    - Outputs from homes and runoff from non-point sources (such as deforested areas, and agricultural lands) also contribute to the water pollution problems in the country, but are currently not monitored;

- Ongoing research, including monitoring and evaluation will be key in making efficient progress. As one aspect of this, it is worth noting that a non-point source management programme is currently being developed to address non-point source pollution at a national scale.

3.5 The Draft Air Pollution Rules

The Draft Air Pollution Rules (DAPRs) were established under the EM Act as a framework for monitoring and controlling air pollution from industrial, commercial and other minor (for example health, education facilities) sources. These DAPRs do not apply to the operational release of air pollutants from motor vehicles, as the control of such emissions still fall under the purview of the Motor Vehicles and Road Traffic Regulations. In addition, the DAPRs do not affect the Public Health Ordinance or the common law regarding nuisance. Between 2005 and 2007, several revisions were made to the DAPRs, but as at 2007, these Draft Rules had still not yet been enacted by Parliament.

Under the DAPRs, four (4) categories of air pollutants are monitored – particulates, non-metallic inorganic pollutants, metallic pollutants and organic pollutants – across a total of 16 designated activities. These 16 designated activities are given in Table 3.6.

Table 3.6: Designated Activities under the Draft Air Pollution Rules

Designated Activities	Designated Activities
1. Agriculture	9. Inorganic Chemical Manufacturing
2. Stationary Fuel Combustion	10. Industry Cooling
3. Wood Products	11. Oil and Gas Storage and Distribution
4. Petroleum Related Industries	12. Industrial/Commercial Electroplating
5. Chemical Product Industries	13. Industrial/Commercial Cleaning
6. Metal Processing	14. Industrial/Commercial Coating
7. Health Sector	15. Waste Handling
8. Polymers and Resins	16. Tertiary Education

As T&T, especially Trinidad, continues to sustain a high level of industrial activity, the enactment and enforcement of the DAPRs will be important in helping to reduce the potentially devastating effects of air pollution locally.

3.6 Environmentally Sensitive Areas (ESAs)

The first ESA, the Matura National Park, was declared in 2004. In 2006, the Nariva Swamp Managed Resource Protected Area was declared as an ESA and in 2007 the Aripo Savannas Scientific Reserve was declared an ESA. Boundary descriptions towards the declaration of two other ESAs, both of which are located in Tobago, were initiated – the Main Ridge National Park, and the Buccoo Reef National Park.

3.7 Environmentally Sensitive Species (ESSs)

Prior to 2007, three(3) species were designated under the ESS Rules as environmentally sensitive – the West Indian Manatee, the Trinidad Piping Guan or Pawi, and the White-

tailed Sabrewing Hummingbird. During the course of 2007, no species were declared as environmentally sensitive, but the EMA initiated several projects and activities to advance implementation of the Rules:

- Stakeholders consultations were held to identify species of concern, and to determine a priority listing of species that would direct the EMA's ESS work programme over the coming years;

- Preparatory work started for two(2) species to be declared as environmentally sensitive – the Ocelot (*Leopardus pardalis*) and the Golden Tree Frog (*Phyllodytes auratus*);

- The EMA was heavily involved in several outreach and awareness activities throughout the country surrounding species under threat in Trinidad and Tobago;

- Research work on the White-tailed Sabrewing Hummingbird, initiated in 2005, continued into 2007. The UWI, St. Augustine was contracted to execute a research project on this species with the objective of determining population size, demographic parameters, habitat requirements, possible habitat range and to develop a GIS map showing the spatial distribution of the species. Although fieldwork was completed in January 2007, the final product would not be submitted until the end of January 2008. This final report is expected to include a management and recovery plan for this species, in addition to research findings on the species. Two hundred and eight(208) birds were banded during the course of the study;

- In January 2007, the EMA initiated research on the Trinidad Piping Guan or Pawi. This project is being facilitated by the UWI, St Augustine. The first conservation efforts for this species arose in the 1980s, involving the implementation of an Environmental Education Campaign, however, it has been suggested that the difficulty faced by the species is so acute that urgent measures are required to safeguard its future. [26] Two (2) sites, Grande Riviere and Morne Bleu, are being monitored to determine the behaviour and habitat use of the Pawi. Researchers are beginning to recognize individual birds and have noticed regular visitation of specific sites. A radio tracking receiver and transmitters were obtained using the additional grants, and a permit to capture three (2) Pawi for radio tracking has been granted by the Wildlife Section of the Forestry Division.

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[26] Delacour, J., and D. Amadon,. 2004. Currassows and related birds. American Museum of Natural History, New York.

4.0 CONCLUDING REMARKS

As was the case in the 2006 ASOE, the current 2007 ASOE includes available data and information on most aspects of the environment with the exception of biodiversity which will be dealt with in the 2008 ASOE.

Some of the findings highlighted throughout this 2007 ASOE include, but are not limited to the following:

- Real GDP growth in 2007 slowed when compared with the same in 2006;
- There was a relatively higher proportion of non-energy related CEC applications to energy-related CEC applications in 2007 when compared with two (2) years previous, in part attributed to the establishment of downstream industries to complement the petrochemical sector;
- Based on a few available studies, both freshwater quality and quantity showed signs of deterioration;
- Coastal water quality and pollution of coastal areas by solid waste were identified as threats to human health. Based on a national-level assessment conducted in 2008, sewage and persistent organic pollutants were identified as the two (2) sources of land-based pollution with the highest impact severity on human health in the coastal area;
- The problem of flooding persisted in 2007 and data collected showed that the most flood-prone areas are those close to urban areas and those highly populated;
- The estimated landings of marine fisheries decreased over the 2006-2007 period;
- In 2007, the importation of CFCs was completely phased out;
- The number of registered motor vehicles on the road continued to increase.

Based on the environmental data and information presented in the current ASOE, it would appear that the outlook for environmental management (and thus sustainable development) in Trinidad and Tobago by the end of 2007 was promising.

Although environmental data remained relatively scarce and the status of and trends in many environmental issues (such as rate of infrastructural development; water quality and quantity; air pollution, and GHG emissions) remained relatively unchanged when

compared with previous years, indicating that the state of the environment was, in general, still deteriorating in Trinidad and Tobago, a number of initiatives were implemented or advanced in 2007. The national-level initiatives which are perhaps most worth noting include:

- Implementation of the Water Pollution Rules by the EMA;
- Progress in a few selected issues under the National Environmental Policy – notably those related to the phasing out of the importation of CFC, and advancement in the ESA and ESS Rules.

There were however a few issues which generated concern. From a legislative standpoint, the amendment to the CEC (Designated Activities) Order (regarding the regularization of quarries) was significant and indicates what could potentially become a worrying trend if not properly managed – deconstruction of enabling environmental legislation (such as the CEC Rules) where there exists no sound scientific basis for such.

The public opposition to and outcry surrounding the development of mega projects in Trinidad and Tobago such as the smelter plants, points to a need for more effective communication and discourse between the Government and civic society about the environmental, social and economic impacts of large-scale development projects. The problem of flooding also requires attention because it is evident that both the extent of area and number of people affected by this natural disaster are getting worse.

There is urgent need for more systematic and systemic planning in order to ensure greater environmental sustainability. And it is also necessary that there be effective implementation of the NEP, the EM Act (and its subsidiary legislation), and other pieces of enabling environmental legislation in order to ensure greater sustainability in planning and development processes.

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Part B: Activities, Accomplishments and Goals of the EMA 2007

1.0 ORGANISATIONAL STRUCTURE

The Authority is governed by a Board of Directors comprising a Chairman and nine other members, appointed by the President of the Republic of Trinidad and Tobago. The Managing Director, who is appointed by the Board, is an *ex-officio* member of the Board. The Board must appoint a Corporate Secretary who must be an employee of the EMA. The Manager of Corporate Services within the EMA currently serves as the Corporate Secretary.

The Chairman and the Board of Directors report to the Minister with responsibility for the Environment. The Members of the Board and Board Committees are detailed in Appendix 1.

The Authority itself is organized into five responsibility centres:

1.1 Managing Director's Office

The Office of the Managing Director is responsible for coordinating and managing all aspects of the work of the EMA. Some specific areas include:

- The fulfilment by the EMA of the objectives detailed in the National Environmental Policy, the Vision 2020 Plan, and the EM Act;
- The implementation and enforcement of the subsidiary legislation arising out of the EM Act, including monitoring conditions in permits and licenses granted pursuant to legislation;
- The development of environmental awareness among the citizenry of Trinidad and Tobago;
- The development of an organisational image that projects a strong, professional organization and engenders confidence in the Authority by members of the public;
- Maintenance of the focus on sustainable development while engaging in environmental enhancement and preservation activity;
- To lead, guide, coach and inspire a team of managers towards the achievement of the highest level of performance;
- To promote a productive work atmosphere that would elicit high standards of performance from staff;
- Ensuring that the programmes and projects of the authority are implemented, consistent with budgetary allocations;
- Developing and delivering on EMA's overall strategic and operating plans;
- Advising the Board of Directors on all matters relating to the operations of the Authority;
- Advancing the work of the Authority through meaningful interaction with the political directorate, and other similar regional and international bodies;

- Developing mutually beneficial relationships with participating national agencies that perform various environmental management functions so that the coordination function is effectively achieved;
- Ensuring that the day-to-day operations of the Authority are effectively managed;

1.2 The Environmental Police Unit

The EMA's Environmental Police Unit (EPU) also falls under the Managing Director's Office. Formed in 1999, the EPU comprises Special Reserve Police officers from the Trinidad and Tobago Police Service. Their responsibilities include patrolling highways, serving Notice of Violations and monitoring noise variations. They also police environmentally sensitive areas and monitor the protection of environmentally sensitive species designated under the EM Act. According to the EPU's 2007 statistics, 2190 tickets were issued for offences including littering, vehicular emissions, transporting garbage and goods without a secured cover, defective fittings (e.g. lights, wipers etc.) and unnecessary discharge of lubricant. Ticket fines for 2007 totalled $438,000.

These officers are appointed as Environmental Inspectors under the EM Act and have the power to enforce legislation outside the EM Act (Motor Vehicles and Road Traffic Act, Minerals Act, Litter Act,) in addition to pollution monitoring and responding to environmental complaints. The Unit falls under the jurisdiction of the Commissioner of Police but, as facilitated by the EMA, they receive day-to-day work assignments from, and submit reports to the EMA.

1.3 The Human Resource Unit

The Human Resource Unit falls under the Managing Director's office and is responsible for the following:

- Manpower Planning;
- Succession Planning;
- Recruitment / Selection;
- Performance Management;
- Training;
- Industrial Relations;
- Compensation and Benefits;
- Employee Relations.

1.4 Legal Services

A full range of legal services are provided to the Authority, these include, but are not restricted to, the following:

- Drafting and development of subsidiary legislation under the EM Act;
- Enforcement of the EM Act and its subsidiary legislation;
- Litigation/representation at the Environmental Commission, Court of Appeal, High Court and other Courts in this jurisdiction;
- Provision of timely and sound legal advice and opinions on the applicability of environmental law to issues affecting the Authority, other governmental entities and the general public;
- Formulation and review of internal policies to ensure that the Authority's activities and operations are consistent with its legislative mandate , national policies and programmes, international environmental law and best practices.
- Resolution of matters using non-litigious methods, e.g. Alternative Dispute Resolution (ADR)/ Mediation;
- Drafting, reviewing, negotiating, and providing advice on the implementation of all legal documents, agreements, contracts and other formal arrangements for operational activities of the Authority with other governmental and non-governmental entities.
- Working in conjunction with Technical Services for the granting of Certificates of Environmental Clearance and Noise Variations.

1.5 Corporate Relations and Public Education

The Corporate Relations and Public Education (CR/PE) Department is responsible for ensuring that the Authority establishes itself as a continuing presence and influences national consciousness.

CR/PE has the responsibility within the EMA to "promote educational and public awareness programmes on the environment" as well as to assist with fulfilment of the mandate to "establish and co-ordinate institutional linkages locally, regionally and internationally.

One of the ways in which the EMA executes its mandate involves making the public more aware and concerned about environmental issues. In focusing on environmental improvement, the EMA develops special education initiatives to change attitudes and behaviours towards a range of issues including Air Pollution, Water Pollution, Noise Pollution, Waste Disposal, and Ecosystem conservation.

- Every year, in collaboration with the Ministry of Education, the EMA coordinates two school competitions: the Primary Schools' Hands-On Environmental Programme and the Secondary Schools' Dramatic Envirologue;
- The EMA delivers lectures, conducts workshops and develop programmes on environmental issues for the benefit of Government Agencies and Ministries, Community Groups and Non-Governmental Organisations, Corporate and Industrial Sector entities, Civic society groups, Faith Based organisations and Educational Institutions;
- The EMA also supports the creation of environmental clubs in primary and secondary schools, was well in communities;
- The Authority is also a clearing house for environmental information. The Information Centre houses a specialized environmental reference collection that includes journals, environmental science texts, copies of legislation and newspaper clippings on environmental issues;
- The National Registers for the Certificate of Environmental Clearance and Noise Pollution Control Rules are also available at the Information Centre;
- The EMA also collaborates with other governmental agencies, statutory bodies in the execution of their environmental education campaigns.

The Corporate Relations function remains critical as it is responsible for:

- Creating awareness of the EMA's mandates;
- Generating a body of public opinion favourable to the EMA and its mandates;
- Building and maintaining a sound corporate image/identity;
- Fostering good relationships with internal and external publics;
- Creating a mutually beneficial relationship with the Media.

1.6 Technical Services

The Technical Services Department is responsible for the implementation of the technical and administrative processes relating to the following:

- Certificates of Environmental Clearance (CECs);
- Water Pollution Management;
- Waste Management;
- Management of Hazardous substances;
- Emergency Incidents Response;
- Complaints Investigation;
- Site Remediation;
- Biodiversity Protection and Conservation;
- Market Based Instruments;
- Environmental Monitoring and Research;
- Inspection and Compliance Monitoring;
- Noise Pollution Management;
- Strategic Environmental Management.

The EMA is charged with the responsibility of implementing subsidiary legislation under the Environmental Management Act, Chapter 35:05 (EM Act) This includes the Noise Pollution Control Rules (2001), the Environmentally Sensitive Species Rules (2001), the Environmentally Sensitive Areas Rules (2001), the Certificate of Environmental Clearance Rules (2001) and most recently the Water Pollution Rules (2001 (amendments to which were prepared on December 18, 2006 and submitted to Parliament for consideration)

In addition to implementation of the foregoing, the EMA designs the framework and provides legal and technical instructions for proposed legislation.

1.7 Corporate Services

The Corporate Services Department is responsible for the following functions:

- Financial Accounting;
- Fund/Treasury Management;
- Procurement and Asset Maintenance;
- Information Technology;
- Secretarial Services to the Board;
- General Administration;
- Health, Safety and the Work Environment.

Corporate Services serves to ensure the implementation of good governance and accountability. It has the primary responsibility for providing logistical support to the organization and making available, timely, accurate and complete information on the financial performance and status of the Authority for sound decision making.

2.0 ACTIVITIES AND ACCOMPLISHMENTS FOR 2007

2.1 Legal Services

As part of its key functions of developing and implementing policies and programmes for the effective management and wise use of the environment and establishing national environmental standards and criteria, the EMA, was actively involved in the continued revision and execution of vital elements of subsidiary legislation in order to modernise and streamline the Authority's regulatory process.

In 2007, the EMA continued its diligent pursuit of enforcement in a field that, as always, mixed elements of environmental and public law, public health and safety and science. Every enforcement action undertaken imposed a high standard and burden of proof on the Authority in order to bring environmental law violators/polluters into compliance with the relevant environmental requirements.

The EMA also continued its representation before the Courts of the land and the Environmental Commission forming a vital link and input in the further development of the common law, practice and procedure in the environmental field.

The following are the matters which engaged the attention of the EMA in 2007:

- **Developing and Promulgating Subsidiary Legislation under the EM Act**

Water Pollution Rules, 2001, as amended

Pursuant to Sections 52 and 53 of the EM Act, which outlines the legislative mandate of the EMA regarding the management of water pollution, the Water Pollution Rules (WPR) were developed by the EMA in 2001. Subsequently, the Authority drafted amendments to the WPR in 2006 and by Legal Notice No. 12 dated January 17th, 2007, those amendments were given legal effect. With the new amendments, house sewers were deleted from the definition of a "sewerage facility" and the definition of "registrable facility" was modified so that sewerage facilities were qualified by "involved in treating discharge from a facility or institution listed in (a) to (d) above." However, those provisions relating to permitting remain applicable.

The WPRs identify three exemptions from the requirement to register as a source of water pollution. These exemptions are:

(a) Operational releases from motor vehicles;

(b) Releases from households except where such households contain industrial or commercial facilities; [and]

(c) Releases authorised by a competent governmental entity into sewerage facilities owned or operated by such competent governmental entity.

Environmentally Sensitive Areas Rules

Under Section 41 of the EM Act and further to the Environmentally Sensitive Areas Rules, the Authority is vested with the power to designate a defined portion of the environment as an environmentally sensitive area (ESA).

By virtue of the Environmentally Sensitive Area (**Aripo Savannas Strict Nature Reserve**) Notice, 2007 the Aripo Savannas was designated an environmentally sensitive area ("ESA") on August 17, 2007.

The Aripo Savannas, is the largest remaining natural savanna (which exemplifies tropical grassland vegetation) in the country and is located in north central Trinidad. The Aripo Savannas ESA contains ten savannas. Geologically, the Savannas are situated on outwash alluvial terraces of sands, gravels and clays fanning out from the foothills of the Northern Range. These sand and gravel deposits have been mined locally for the construction industry.

Striking vegetation communities are unique to the Aripo Savannas, and the area is one of the more intensively studied natural ecosystems in Trinidad. Of the 457 species identified so far, 383 species are restricted to the Aripo Savannas with 16 to 20 that are rare or threatened and two endemic species of plants. The ten open savanna communities characterising the 'savannas' have low growing herbaceous vegetation caused by an impervious hardpan layer, centimetres below the soil surface. The Aripo Savannas has long been identified as an ecosystem of unique biological diversity, worthy of national protection within a system of protected areas for Trinidad and Tobago. Its savanna vegetation is also of national significance due to the presence of endemic species of flora and rare orchids.

The Aripo Savannas has been subjected to many disturbances and threats. The area has been logged, mined, burnt and squatted upon. Formerly part of an extensive Forest Reserve, encroachment from a myriad of human activities is isolating the savannas.

The Environmentally Sensitive Area (**Aripo Savannas Strict Nature Reserve**) Notice, 2007 has extensively, subject to conditions, limited approximately 24 uses and activities in the Aripo Savannas. Examples of the limits on uses and activities include occupation or use of land, dredging, filling and excavating, prospecting or surveying for the purpose of mineral extraction and, the removal, damage or exportation of animals or plants, soil or any material from the land surface.

- ***View of one of the Aripo Savannas***

Environmentally Sensitive Species Rules

Similar to its powers to designate a defined portion of the environment as an environmentally sensitive area (ESA), so too, under Section 41 of the EM Act and further to the Environmentally Sensitive Species Rules, the Authority is vested with the power to designate any species of living plant or animal as an environmentally sensitive species (ESS).

Cabinet has granted approval for the designation of the Golden Tree Frog and the Ocelot as environmentally sensitive species. The EMA has begun the drafting of Legal Notices that would designate these two species as ESS pursuant to the Environmentally Species Rules.

- ***Ocelot***

- **Golden Tree Frog**

Draft Air Pollution Rules, 2007

In furtherance of its mandate to manage air pollution as required by Sections 49-51 of the EM Act, the draft Air Pollution Rules 2007 which were initially developed by the Authority in 2001, were forwarded to the Ministry of Public Utilities and the Environment on January 26, 2007 for further revision.

- *Enforcement*

Pricesmart

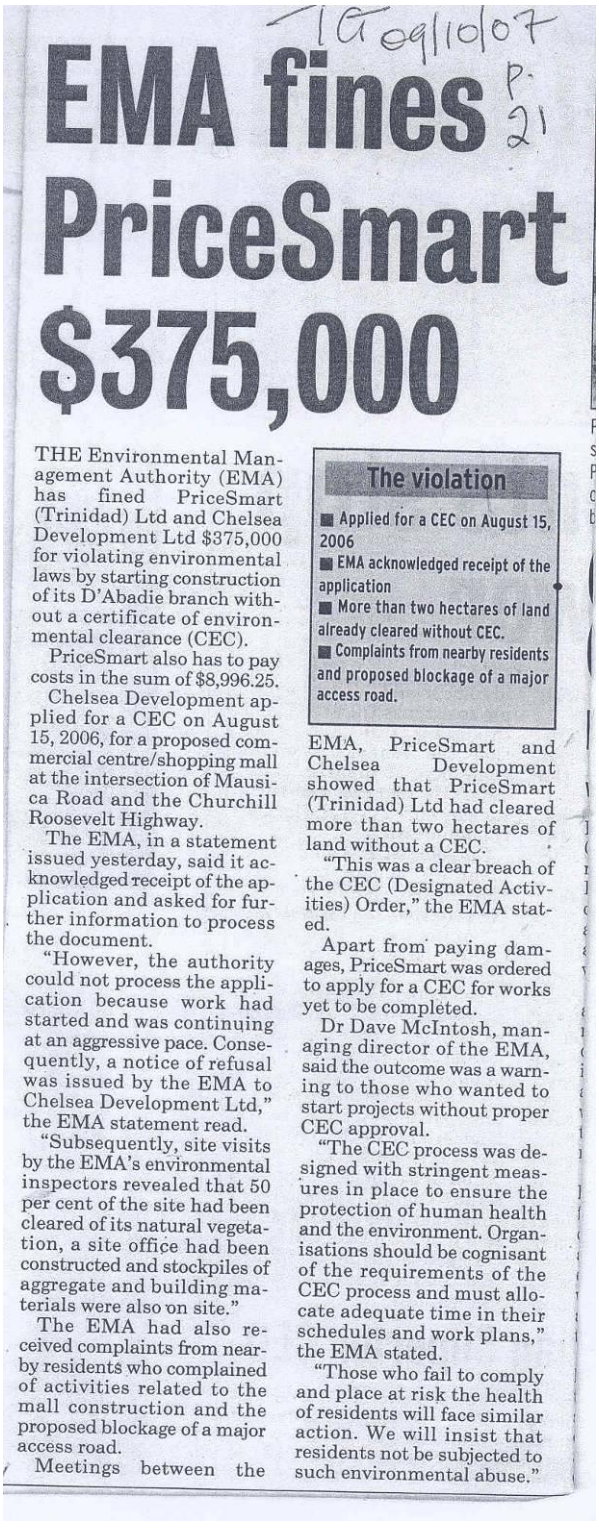
On August 15th 2006, an application for a Certificate of Environmental Clearance (CEC 1589/2006) was received from Chelsea Development Ltd for the development of 5.0925 hectares of land for commercial purposes at the Corner of Mausica Road and Churchill Roosevelt Highway, Mausica for the establishment of a shopping mall and associated parking (Phase 1- PriceSmart Store).

However, further to investigations conducted by the EMA, it was found that Pricesmart (Trinidad) Limited started works on the PriceSmart store before the CEC application was determined.

Following a Notice of Refusal to grant the said CEC, enforcement action by virtue of Notice of Violation NV CEC 83 of 2007 was served on August 21st 2007.

Subsequently the EMA filed an interlocutory application seeking an injunction at the Environmental Commission against both Chelsea Development Ltd. and Pricesmart (Trinidad) Ltd. The matter was referred to mediation by the Environmental Commission.

Representation meetings held between the EMA and Pricesmart resulted in the amicable resolution of the matter. Pricesmart agreed to pay damages and costs in the sum of $378,996.08 and to implement mitigation measures as well as submit a CEC application for the remaining works.



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EMA fines PriceSmart $375,000

THE Environmental Management Authority (EMA) has fined PriceSmart (Trinidad) Ltd and Chelsea Development Ltd $375,000 for violating environmental laws by starting construction of its D'Abadie branch without a certificate of environmental clearance (CEC).

PriceSmart also has to pay costs in the sum of $8,996.25.

Chelsea Development applied for a CEC on August 15, 2006, for a proposed commercial centre/shopping mall at the intersection of Mausica Road and the Churchill Roosevelt Highway.

The EMA, in a statement issued yesterday, said it acknowledged receipt of the application and asked for further information to process the document.

"However, the authority could not process the application because work had started and was continuing at an aggressive pace. Consequently, a notice of refusal was issued by the EMA to Chelsea Development Ltd," the EMA statement read.

"Subsequently, site visits by the EMA's environmental inspectors revealed that 50 per cent of the site had been cleared of its natural vegetation, a site office had been constructed and stockpiles of aggregate and building materials were also on site."

The EMA had also received complaints from nearby residents who complained of activities related to the mall construction and the proposed blockage of a major access road.

Meetings between the EMA, PriceSmart and Chelsea Development showed that PriceSmart (Trinidad) Ltd had cleared more than two hectares of land without a CEC.

The violation

- Applied for a CEC on August 15, 2006
- EMA acknowledged receipt of the application
- More than two hectares of land already cleared without CEC.
- Complaints from nearby residents and proposed blockage of a major access road.

"This was a clear breach of the CEC (Designated Activities) Order," the EMA stated.

Apart from paying damages, PriceSmart was ordered to apply for a CEC for works yet to be completed.

Dr Dave McIntosh, managing director of the EMA, said the outcome was a warning to those who wanted to start projects without proper CEC approval.

"The CEC process was designed with stringent measures in place to ensure the protection of human health and the environment. Organisations should be cognisant of the requirements of the CEC process and must allocate adequate time in their schedules and work plans," the EMA stated.

"Those who fail to comply and place at risk the health of residents will face similar action. We will insist that residents not be subjected to such environmental abuse."

- ***Trinidad Guardian Headline***

Sahadeo Kurjah- NV/CEC 5/2003 and NV/CEC 79/2007

Two Notices of Violations were issued against Sahadeo Kurjah for works consistent with the operation of an automotive garage and/or auto body shop which fell within Designated Activity 43(a) of the Schedule to the Certificate of Environmental Clearance (Designated Activities) Order. The EMA found that Mr. Kurjah was engaged in Designated Activity 43(a) without having applied for and obtaining a CEC.

The first Notice of Violation was resolved by virtue of a Consent Agreement entered into between Mr. Kurjah and the EMA in 2004. Subsequently, Mr. Kurjah continued to operate the automotive garage without having obtained a CEC for his establishment which led to the service of a second Notice of Violation- NV/CEC 79/2007 .This Notice of Violation was not resolved and an administrative order was issued in respect of NV/CEC 79/2007 as evidence of ongoing works in breach of section 35(2) of the Act (failure to apply for and obtain a CEC) causing dust, fumes and other emissions to affect neighbouring residents.

The EMA intends to proceed with further legal action in this matter pursuant to section 67 of the Act, by filing an application for enforcement of the Administrative Order in the Environmental Commission.

NIDCO - NV/CEC 84/2007

On August 21, 2007, the EMA served a Notice of Violation NV/CEC 84/2007 on NIDCO for failing to apply for and obtain a CEC for the conduct of Designated Activity 13(a) listed in the Schedule to the Certificate of Environmental Clearance (Designated Activities) Order. Activity 13(a) is more clearly defined as "the establishment, modification, expansion, decommissioning, or abandonment (inclusive of associated works) of marinas, piers, slipways, jetties or other coastal features.

The Authority and NIDCO are engaged in settlement discussions with a view to resolving the Notice of Violation.

- **Litigation**

Trinidad and Tobago National Petroleum Marketing Company Limited vs. The Environmental Management Authority, EAP 002 of 2006 [Environmental Commission]

This case involved a claim for confidentiality made under the Certificate of Environmental Clearance Rules. Under the CEC Rules, an applicant may, in an application for a CEC, assert

a claim that any of the information submitted along with its application is a trade secret or confidential business information.

The Trinidad and Tobago National Petroleum Marketing Company Limited (NP) appealed a decision of EMA to the Environmental Commission with respect to the EMA's decision to deny their Claim for Confidentiality regarding fuel storage capacity and site layout regarding its application for a CEC (CEC 1338/2006) made on March 23, 2006. By judgment dated November 30, 2006, the Commission ordered that the EMA reconsider NP's application on or before December 22, 2006. NP's application for cost was denied.

The EMA applied for an extension of time and was given until January 22, 2007 for such reconsideration. The date for reconsideration was then extended by mutual agreement to March 21, 2007. By letter dated March 21, 2007, NP's confidentiality claim was again denied by the EMA.

On April 18, 2007, NP filed an Appeal EAP 004 of 2007 at the Environmental Commission against the EMA's decision to deny the confidentiality claim again. This appeal was subsequently withdrawn by consent with no order as to costs on July 09, 2007.

Michelle Dove v. Atlantic LNG, the Attorney General and the Environmental Management Authority, [Environmental Commission]

Under Section 69 of the EM Act, any private party may institute a civil action at the Environmental Commission against any other person for a claimed violation of any of the environmental requirements specified in the EM Act. These civil actions are termed direct private party action under the EM Act.

On August 17, 2006, a Direct Private Party action was filed at the Environmental Commission against Atlantic LNG (ALNG) concerning an alleged violation of the Community Awareness and Emergency Response (CAER) clause in CEC 114 of 2002 which the EMA granted to ALNG. The CEC CAER condition required Atlantic LNG to employ the principles of Community Awareness and Emergency Response and prepare and implement education and awareness programmes to ensure that communities are informed of the risks and participate in the plans and procedures to deal with possible emergencies. The EMA was requested to attend at the Commission, in which the Attorney General was represented as well. This matter proceeded to mediation.

This action was settled *via* a compromise agreement arrived at by mediation between ALNG and Michelle Dove. On March 29, 2007, the Commission ordered that leave be granted to Michelle Dove to discontinue proceedings against ALNG, Attorney General and EMA.

Applications for judicial review regarding grant of CEC to Alutrint Limited

This matter, CV 2007 – 02263 [High Court]involves several applications for judicial review brought by the following parties:

1. People United Respecting the Environment (PURE) and Rights Action Group (RAG) against the Environmental Management Authority (EMA), Alutrint Limited and The Attorney General.

2. Smelta Karavan against the Environmental Management Authority (EMA), Alutrint Limited and The Attorney General.

Another application for judicial review, CV 2007- 02272 [High Court], was also brought: Application by Chatam/Cap-de-Ville Environmental Protection Company against the Environmental Management Authority (EMA), Alutrint Limited and The Attorney General

On April 2, 2007, the EMA granted CEC1033/2005 to Alutrint Limited to carry on at Union Industrial Estate, Main Site 'B', La Brea Designated activity 21 listed in the Schedule to the CEC Designated Activities Order 2001. The application was made by Alutrint Limited in 2005 for the establishment of an Aluminium Smelter Complex with a target capacity of 125,000 metric tonnes per annum.

Activity 21 relates to the establishment of a facility for the production and reforming of metals or related products.

On June 29, 2007, several claimants filed applications for leave to apply for judicial review of the decision of the EMA to grant a CEC1033/2005 to Alutrint Limited for the construction of the Aluminium Smelter at Union Village, La Brea. On September 13, 2007 the Court granted leave to all the intended Claimants to proceed for judicial review in the terms of the relief sought and upon the grounds stated in their respective Notices of Application. On the same date, the Court further granted special leave to the Attorney General to participate in the actions and further directed that "the EMA be named as the Defendant and Alutrint Limited and the National Energy Corporation be named as the Interested Parties."

As at December 31st, this matter is proceeding to litigation.

2.2 Corporate Relations and Public Education (CR/PE)

- ***World Environment Day***

The World Environment Day (June 5) theme for 2007 was "Melting Ice – A Hot Topic?" which was selected by the United Nations to alert the world to the effects of climate change. Through its World Environment Day Steering Committee, the EMA mounted mall exhibitions in Trinidad as well as Tobago. The committee comprised representatives from partner agencies such as the Water and Sewerage Authority; Solid Waste Management Company Ltd; Town and Country Planning Division; Trinidad & Tobago Chamber of Industry and Commerce; Forestry Division; the Authority's current line ministry – the Ministry of Public Utilities and the Environment; United Nations Information Center; United Nations Development Programme; Meteorological Services and the Horticultural Division. The EMA also hosted a three-day conference which featured speakers who addressed different issues related to climate change such as Planning and Development, Energy Conservation and Biodiversity Issues.

The Authority also commemorated this international day by coordinating its annual Green Leaf Awards Ceremony.The ceremony celebrated the 10th anniversary of the Green Leaf Awards and was geared at revisiting past Awardees, and receiving updates on their projects in a quest for sustainable projects and new initiatives.

❖ **Managing Director, Dr. Dave McIntosh cuts the ribbon to open the WED exhibition at Trincity Mall. Manager, Corporate Relations and Public Education, Dr. Yvette Guy look on behind.**

❖ **The WED exhibition drew a large crowd as it was opened to the public and school visits.**

- ***Media Interventions***

Collaboration with the media successfully continued in 2007. A number of media conferences were held during the year to discuss emerging environmental issues as well as the work of the organisation and newspaper articles produced by the EMA were published weekly. These articles sought to educate the public on issues such as Climate Change, Noise Pollution, the work of the Environmental Police Unit, the dangers of Lead Poisoning, the importance of the Certificate of Environmental Clearance (CEC) process, and the winners of the EMA's school competitions.

Television, radio and print advertising remained critical communication tools for the Authority and staff took part in television and radio interviews throughout the year to keep the

nation abreast with issues such as: the Water Pollution Rules; Noise pollution and its consequences; the designation of the Aripo Savannas Scientific Reserve as an Environmentally Sensitive Area (ESA) and the call for public comments regarding CEC applications.

Documentaries on water pollution, newspaper advertisements, and television and radio interviews were some of the tools employed over the period January to September 2007 to boost public awareness. The implementation of any new legislation by the EMA, including the Water Pollution Rules is accompanied by sensitisation efforts. Documentaries on water pollution, newspaper advertisements, and television and radio interviews were some of the tools employed over the period January to September 2007 to boost public awareness.

Sensitisation seminars were hosted throughout the year for targeted stakeholders such as Chambers of Commerce, Petrotrin, the Livestock Association, the University of the West Indies, (UWI), Caribbean Industrial Research Institute (CARIRI), WASA, WRA, Point Lisas Industrial Estate landlord (PLIPDECO), Trinidad-based hoteliers and restaurateurs and the Trinidad and Tobago Bureau of Standards (TTBS).

The EMA was also involved in community meetings and public consultations to address matters under the CEC process regarding ESSAR Steel Caribbean Ltd., Aluminum Company of America (ALCOA), and National Energy Corporation (NEC) of Trinidad & Tobago Ltd., just to name a few.

Water Pollution Rules

EMA environmental management authority

The Government of the Republic of Trinidad and Tobago (GoRTT) has put legislation in place to ensure that as our nation grows and development occurs, the environment will be protected.

The Water Pollution Rules apply to activities which can negatively affect the quality of our rivers and beaches, groundwater, coastal and marine environments and environmentally sensitive areas.

Any activity, not properly managed, can have serious impact on the quality and future supply of our water. Having your business registered as a source of water pollutants will ensure that there is a comprehensive inventory of all sources of water pollution in the country.

Who is required to register as a Water Pollutant Source?

A person or enterprise engaged in any activity which discharges water pollutants into the environment. These activities include: **Industrial facilities** (e.g. petrochemicals, quarries, oil and gas), **commercial facilities** (e.g. hotels, restaurants, vehicle service), **agricultural facilities** (e.g. sugar refineries, distilleries, breweries, feedlots), **institutions** (e.g. hospitals, laboratories, universities) and **sewerage facilities** (e.g. package treatment plants, centralized wastewater treatment plants).

DEADLINE FOR REGISTRATION - MAY 4th, 2007

For further information contact:

Environmental Management Authority

8 Elizabeth Street St. Clair, Port of Spain

Tel: 628-8042 Fax: 628-9122 Email: ema@ema.co.tt

OR

2 Dumfries Road, La Romain

Tel: 697-7619/1377 Fax: 797-0309 Email: ema@ema.co.tt

Exceptions:

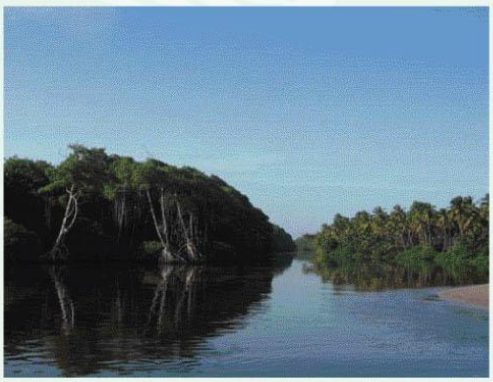
- Discharges into sewers approved by a competent government agency.
- Discharges from households except where such households contain a factory or commercial establishment.

Who may be asked to apply for a Water Pollution Permit?

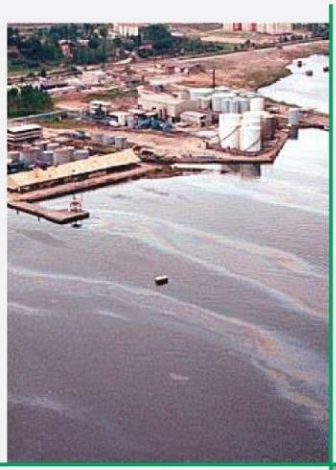
A person or enterprise engaged in any activity which discharges water pollutants at levels in contravention of those prescribed in the Water Pollution Rules.

If you are engaged in any activity that discharges water pollutants into the environment, you must first register with the EMA, following which you may be asked to apply for a Water Pollution Permit. Forms are available at the EMA's offices.

Compliance with the Water Pollution Rules is one way we can ensure that our health and the environment will be protected for present and future generations.



THE WATER POLLUTION RULES ARE NOW LAW!



Do you own or operate any of the following establishments?

- Manufacturing of:
  - -Food Products and Beverages
  - -Paper and Paper Products
  - -Rubber and Plastic Products
  - -Glass/Ceramic/Stone Cutting
  - -Cement/Concrete/Asphalt
  - -Basic Metals/Fabricated Metal Products
  - -Machinery and Equipment/Furniture
  - -Chemicals and Chemical Products
- Refined Petroleum Products
- Extraction of Crude Petroleum and Natural Gas
- Service Activities Incidental to Oil and Gas Extraction
- Mining and Quarrying
- Recreational, Cultural and Sporting Activities
- Hotels, Guest Houses, Restaurants, Canteens and Bars
- Publishing and Printing Activities
- Animal Farming/Fish Farming
- Logging and Related Services Activities
- Maintenance and Repair of Ships/ Aircrafts/ Motor Vehicles/Car Washes
- Sale of Automotive Fuel/Aircraft Fuel/ Ship Fuel
- Air Ports/Sea Ports
- Recycling of Metal and Non-Metal Waste and Scrap
- Sewerage and Refuse Disposal and Treatment
- Institutions with Laboratories, Cafeterias or Workshops such as Schools, Medical facilities, Prisons etc
- Other Service Activities such as: Laundry/Dry Cleaning, Hairdressing and Beauty Treatment, Funeral Homes and Related Activities

- **All other activities, which discharge liquid waste into the environment**

Registration is MANDATORY!

Any organization breaching this law will face an initial penalty of **$10,000 in the first instance and a fine of $5,000 per day if the breach continues.** Further enforcement action can also include immediate closure of your establishment. Also, any economic benefit that is derived from failure to comply with The Water Pollution Rules can be confiscated.

The Water Pollution Rules apply to activities that can negatively affect the quality of our rivers, beaches, groundwater, coastal and marine environments and environmentally sensitive areas.

The Environmental Management Authority (EMA) **will pursue enforcement action**, so if you have not yet applied for Source Registration, please submit your application as soon as possible.

Who MUST Register?

Persons or companies that release into the environment, wastewater containing water pollutants above the levels given in the First Schedule of the Water Pollution Rules, 2001, must register as sources of water pollutants.

Where Can I Register?

Registration forms, detailed instructions and copies of the Water Pollution Rules are available at the **EMA's offices in Port-of-Spain and San Fernando** and **D.N.R.E. - Tobago**, as well as on the EMA's website at **www.ema.co.tt**

For further information, contact:

The Department of Natural Resources & Environment (D.N.R.E.)

Tobago House of Assembly
Unit 6 & 7, High Moore Centre,
Scarborough, Tobago
Phone: 660-7636
Fax: 639-5232
thadnre@yahoo.com

The Environmental Management Authority

#8 Elizabeth Street,
St. Clair, Port-of-Spain
Tel.: 628-8042,
Extensions 2305/2308/2316
/2310/2280/2262
Fax: 628-9122

#2 Dumfries Road
La Romaine
Tel.: 697-7619/1377
Fax: 697-0309

EMA environmental management authority

Email: ema@ema.co.tt OR download application forms from our website: http://www.ema.co.tt

- ***International Coastal Clean-up 2007***

The EMA also participated in the annual International Coastal Clean-up (ICC) at its adopted beach, Salybia. The EMA is a member of the national ad hoc steering committee which reports to the Ocean Conservancy of Pollution Prevention and Monitoring of Virginia, U.S.A. This is an organization that has been arduously working to ensure that our oceans provide a healthy environment for an abundant and diverse population of marine animals. The Ocean Conservancy's International Coastal Clean-up (ICC), which started in 1986 is the world's largest volunteer event of its kind that allows people to remove garbage from the beaches and waterways, whilst identifying the sources of the garbage with the hope of changing the behaviours that cause the pollution.

The steering committee comprises government ministries, NGOs, CBOs and private organizations. They include -Water & Sewerage Authority (WASA); bpTT; Atlantic LNG; Piranha International Ltd; Community Environmental Protection & Enhancement Programme (CEPEP); West Indian Tobacco Company Limited (WITCO); Environmental Management Authority (EMA); Institute of Marine Affairs (IMA); Tourism Development Company of Trinidad and Tobago (TDC); Trinidad & Tobago National Petroleum Marketing Company Limited; Yacht Services Association of Trinidad and Tobago (YSATT); Chaguaramas Development Authority (CDA); Forestry Division; Protectors of the Environment; Girl Guides Association; Ministry of Planning, Housing & The Environment (MPH&E); The Trinidad & Tobago Solid Waste Management Company Limited (SWMCOL) and The Heroes Foundation.

On that third Saturday of September, the EMA together with its 65 volunteers from schools, Community-Based and Non-Governmental Organisations collected 100 bags of garbage weighing 1,455 pounds in just two hours. In 2007, a total of 2,233 volunteers collected an astonishing 33,875.2 pounds of debris from 11 beaches in Trinidad and Tobago.

- **EMA staff and volunteers collected and removed 1,455 pounds of garbage from the Salybia beach, in just two hours.**

- ***Schools' Programmes***

The year 2007 marked the ninth year of competition for both the Primary Schools' "Hands-on" and the Secondary Schools' Competitions. Primary school students developed projects around the theme, *Our Environment, Our Responsibility – Action is Key* and the Secondary Schools' Public Speaking Competition evolved into the Dramatic Envirologue Competition. The EMA continues to partner with the Ministry of Education on these programmes.

The Secondary Schools' Dramatic Envirologue (formerly Public Speaking) was hosted during the period January 2007 to March 2007. This competition served to sensitize the youth of our nation to sustainable development issues as well as, acted as a vehicle for the dissemination of information to the public.

The ninth annual Primary Schools' "Hands-On" Competition culminated in an eventful Award Ceremony which took place on June 20th 2007, at the Rudranath Capildeo Learning Resource Centre, Couva.

Twenty-two schools contested the competition. The theme 'Our Environment, Our Responsibility: Action is Key' was addressed with a plethora of projects and performances. Students brought their research to fruition through displays, clean-up campaigns and tree planting exercises. It was agreed that students were more cognizant of their responsibility to the environment and were clearly encouraged to act more positively through their participation in the competition.

- ***Anti-Litter Campaign***

The EMA continued its campaign to sensitise the population about proper waste disposal. Advertising was done on both radio and television, particularly during key festive periods, such as Carnival, Easter and Christmas, when more waste tends to be generated.

- ***Disaster Preparedness and Management***

Under the Disaster Preparedness and Management Committee of the Ministry of Public Utilities and Environment, the EMA conducted several lectures and mounted displays to inform groups about different types of disasters, as well as preparedness plans that would mitigate effects. The collaborative committee comprised all the agencies which fell under the line Ministry of Public Utilities & the Environment such as the Forestry Division, the Water and Sewerage Authority, Solid Waste Management Company Ltd; the Meteorological Services of T&T; the Horticultural Division, EMA and the T&T Postal Service.

- ***Climate Change Education***

The EMA represented the Government of Trinidad and Tobago at a United Nations Framework Convention on Climate Change (UNFCCC) workshop for Small Island Developing States (SIDS) in July 2007, in Saint Lucia. This workshop was held to promote public awareness, education and training on climate change issues (Article 6 of the Convention) among SIDS from the Caribbean, Asian, African and Pacific regions.

- ***EMA's Environmental Education Officer, Marcia Tinto (first left, front row) is seen in this group photo of the female delegates with the Saint Lucia Governor-General****Her Excellency Dame Pearlette Louisy****(fourth from left) at the Small Island Developing States (SIDS) Workshop on the Implementation of UNFCCC Article 6 (Education, Training and Public Awareness).***

- ***Dengue Awareness and Prevention***

The EMA continued its partnership with the Ministry of Health on a Dengue Awareness and Prevention Media Campaign. The goal of this collaborative initiative was to sensitise the nation to this life-threatening disease through the print and electronic media.

- ***Lectures and Displays***

Throughout 2007, the EMA delivered more than 217 lectures and mounted more than 30 displays for the nation's schools, NGOs, CBOs, Faith-Based Organisations (FBOs) and other civil society groups. The Authority also continued to work closely with SERVOL and the Civilian Conservation Corps (CCC) in the provision of environmental education for participants of these programmes.

- **Information Centre**

The EMA's Information Centre continued to act as a clearinghouse for environmental information. The Centre contains a specialized environmental collection that includes journals, environmental science texts, copies of environmental legislation and information files gathered from newspapers clippings.

The National Registers for the Certificate of Environmental Clearance (CEC) Rules and the Noise Variation applications were also viewed by members of the public.

In 2007, a total of 1,559 persons visited the Information Centre located at the EMA's Head Office on Elizabeth Street. There were 2,463 external queries, 1,337 internal queries and 841 requests to view the CEC Register.

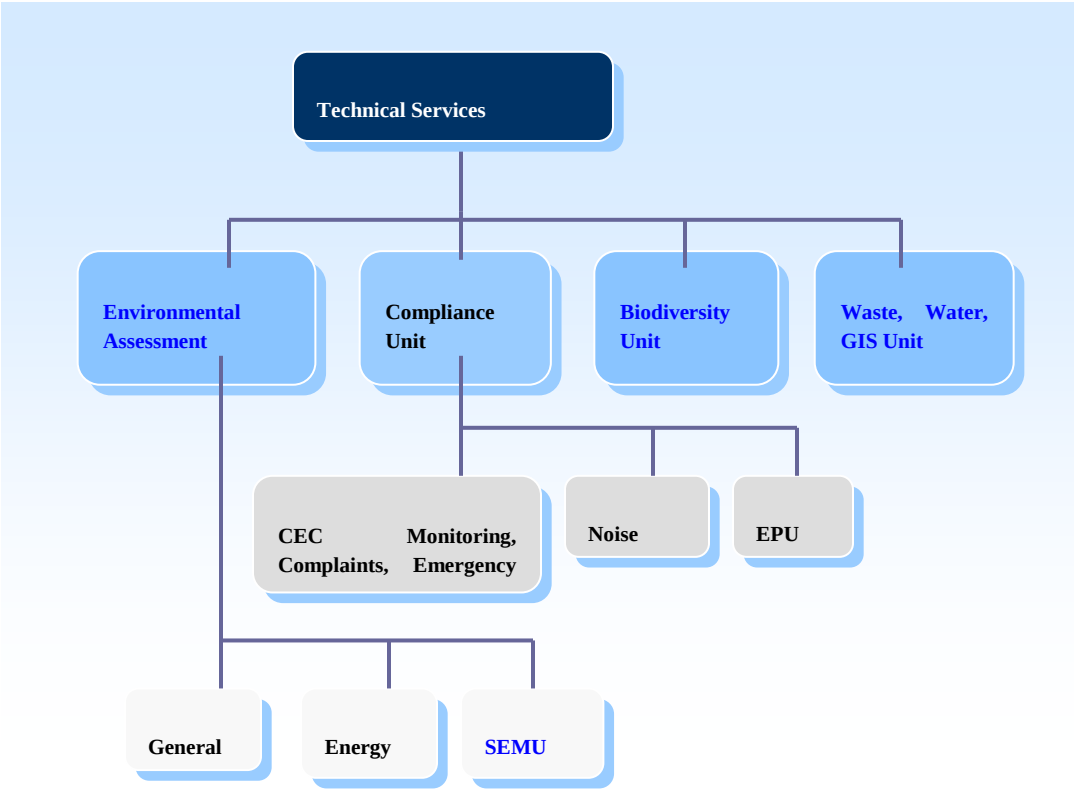
2.3 Technical Services

Technical Services, due to the nature of its operational activities, has to have a very close working relationship with other responsibility centres within the EMA:

- The office of the Managing Director for signing off on permits and projects;
- Legal Services, for the development and implementation of its legal instruments;
- Corporate Services, to provide the resources required to execute its functions;
- Corporate Relations and Public Education (CR/PE), through which the EMA raises public awareness and encourages public involvement. Over the last few years, the importance of the relationship between Technical Services and CR/PE has grown, and within the EMA's work plan for 2007-2008, there is a strategic attempt to link the their work functions under each strategic priority.

What this means therefore is that each strategic priority now lists an education and public awareness component along with relevant technical projects.

Very important for the effective operation of the EMA is its use of Memoranda of Understanding (MoUs) with other governmental agencies to execute functions that it does not have the authority to execute, or functions that the Agency is logistically unable to accomplish on its own.



Technical Services from 2004- 2007

Technical Services' closest stakeholders include other responsibility centres within the EMA. These include Legal Services and Corporate Services whose functions are key in supporting Technical Services to achieve EMA's objectives. Without support from Legal Services, for example, Technical Services' ability to properly enforce environmental laws is severely diminished. Yet it has been recognised that the current capacity of the Legal Services is too small (about four percent of the organisation) to support the work of the rapidly expanding Authority.

The relationship that other Government entities have with EMA is multifaceted. Perhaps the most important role of the Government is that of a co-regulator. Several agencies such as the Town and Country Planning Division (TCPD) and the TTPS have a supportive, co-regulatory role with the EMA in implementation of environmental laws. Technical Services frequently co-opts the support of key technical advisors from these and other agencies [such as the Ministry of Works and Transport (MOWT), the Water and Sewerage Authority (WASA), the Water Resources Agency (WRA), the Fire Services, the Ministry of Labour and the Land Settlement Agency (LSA)] to provide support and boost technical capacity during the CEC decision-making process. This activity generally enhances inter-organisational communication and cooperation as well.

Some Government agencies are both co-regulators and customers of the EMA, but it is worth pointing out that some governmental agencies interact with EMA solely as customers, for example the Estate Management and Business Development Company (EMBD), the National Infrastructure Development Company (NIDCO) and Urban Development Corporation of Trinidad and Tobago Limited (UDeCOTT).

- ***Clean Air***

In the absence of locally-derived air quality standards, the DAPRs adopt international standards established mainly by the World Health Organisation (WHO), and these standards are currently being used in other aspects of EMA's regulatory work. For example, the EMA currently utilises WHO's standards to develop CEC Conditions that can be monitored. Existing emitters who did not fall under the CEC Rules or older CEC applications with less stringent conditions however, may currently fall outside of the EMA's jurisdiction.

It was recognised very early however that measures needed to be put in place so that Trinidad and Tobago can develop its own air quality standards. The first steps towards creating an ambient air quality monitoring network in Trinidad and Tobago were the establishment of a station set up at Toco by the United States Geological Survey (USGS) and the subsequent establishment of an equipped ambient air quality monitoring by the

EMA on the Point Lisas Industrial Estate in September, 2004. It is envisaged that the eventual network would facilitate the development of background air quality data, which can be used in refining air pollution standards and guideline criteria.

The equipment being used by the EMA in its ambient air quality monitoring station at Point Lisas is capable of continuous measurement of sulphur dioxide, nitrogen oxides, carbon monoxide and ozone, as well as meteorological parameters such as precipitation, wind direction and speed, barometric pressure and irradiance. Since 2004, data has been collected from Point Lisas and analysed on a regular basis. What the data so far collected and analysed show is that the levels of all air pollutants have been within acceptable levels over most of the monitoring period.

Trinidad and Tobago signed and ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994. The ultimate objective of this Convention, as stated in Article 2, is the "stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". Governments party to this convention are required to report on the steps that they are taking or envisage undertaking to implement the Convention. The report on these steps is known as a country's National Communication. Trinidad and Tobago's First National Communication was submitted in 2001.

Specific vulnerable areas identified in the First National Communication included:

- **Caroni Basin** – as it is the most densely populated area of the country and it contains the greatest reserves of surface and groundwater which supply a significant proportion of the needs of Trinidad and is believed to be most vulnerable to the impacts of climate change

- **Nariva Swamp** - is the largest and most diverse wetland ecosystem locally with some economic importance in terms of agriculture and fishing, and due to its susceptibility to saltwater intrusion the Nariva Swamp it is likely to be extremely vulnerable to sea level rise

- **Point Lisas Industrial Estate** – was developed near the coastline and is thus vulnerable to sea level rise and tidal variation

PROJECTS

In the 2006-2007 fiscal year, the EMA sought to develop a Pollutant Release and Transfer Register System with activities to include collection of baseline data, conducting consultative sector workshops and creation of an electronic database.

Given the budget constraints at that time, the EMA engaged with PLIPDECO (landlord to the Point Lisas Industrial Estate) to carry out preliminary research through a tertiary level student. A draft final report was prepared in 2007. Funding was reassigned in 2007-2008 to this project.

As required under the EMA's strategic plan, fuel analysis studies were carried out on diesel fuel during 2007 to ensure compliance with existing standards. The analysis did not uncover any breaches of the relevant standards.

The Montreal Protocol is an international treaty designed to protect the ozone layer by phasing out the production of a number of substances believed to be responsible for ozone depletion. In early 2007, Trinidad and Tobago's obligations under the Montreal Protocol were partially transferred from the EMA to the EMA's line ministry, the Ministry of Public Utilities and the Environment.

Trinidad and Tobago is currently in the process of executing the Terminal Phase-out Management Plan (TPMP). It is a performance-based action programme to ensure the completion of the phase out of all CFCs, and incorporates import quota reduction, recovery and recycling equipment provisions, training and other capacity building initiatives.

One of the requirements of the TPMP is the collection and submission of data on the importation of Ozone Depleting Substances (ODS). During early 2007, requests were issued for 2006 imports and during the year, the data collected was processed.

Other activities under TPMP include the following:

- Capacity development in over 155 companies in the Mobile Air Conditioning (MAC) and Refrigeration Sector to phase out CFCs continued in 2007. EMA also liaised with companies to ensure that the recovery units (used to remove and recover the ozone depleting gases and subsequently store them in cylinders during servicing rather than venting them into the air were functional and effective. This support was useful in assisting the sector to complete the phase out of CFCs within the national deadline of 31 December 2007.

- Training to boost the technical capacity and the skills of Mobile Air Conditioning and Refrigeration Sector continued in 2007. The Air Conditioning and Refrigeration Industry Association (ARIA) trained 187 technicians in Good Refrigeration Practices.

- Twenty eight sample retrofits on refrigerators and vehicles were carried out in 2007 to give technicians hands-on experience in handling systems in an ozone friendly manner. Demonstration on vehicles and refrigerators were conducted to ensure that technicians within the sector possess practical experience in handling air conditioning and refrigeration systems in an ozone friendly manner.

- The Commercial Refrigeration Sector, continued to benefit from the Commercial Refrigeration Conversion Project which encouraged retrofitting or replacement of existing refrigeration systems which use ODS, to systems that use alternative refrigerants using a rebate mechanism. Phase 2 of this project commenced in 2007 with a survey of the commercial sector, which revealed that poultry shops, ice cream manufacturers and ice wholesalers and retailers required retrofitting assistance. Interested businesses were invited to submit projects for approval on a first come first serve basis. Eight projects were approved and work commenced on these projects during the year.

Trinidad and Tobago is currently implementing its fourth institutional strengthening project, which includes public awareness and in particular, World Ozone Day activities which included newspaper supplements, dissemination of ozone activity booklets, the production of ozone jigsaw puzzles and the production of a commemorative stamp.

The EMA continues to benefit from a mutual working relationship with PLIPDECO in terms of associated work on its proposed Pollutant Release and Transfer Register System and housing of its first air quality monitoring station.

In 2007, the EMA participated in the third Meeting of the Persistent Organic Pollutants Review Committee (POPRC), a subsidiary body to the Stockholm Convention. Trinidad and Tobago's membership on POPRC ends May 2008.

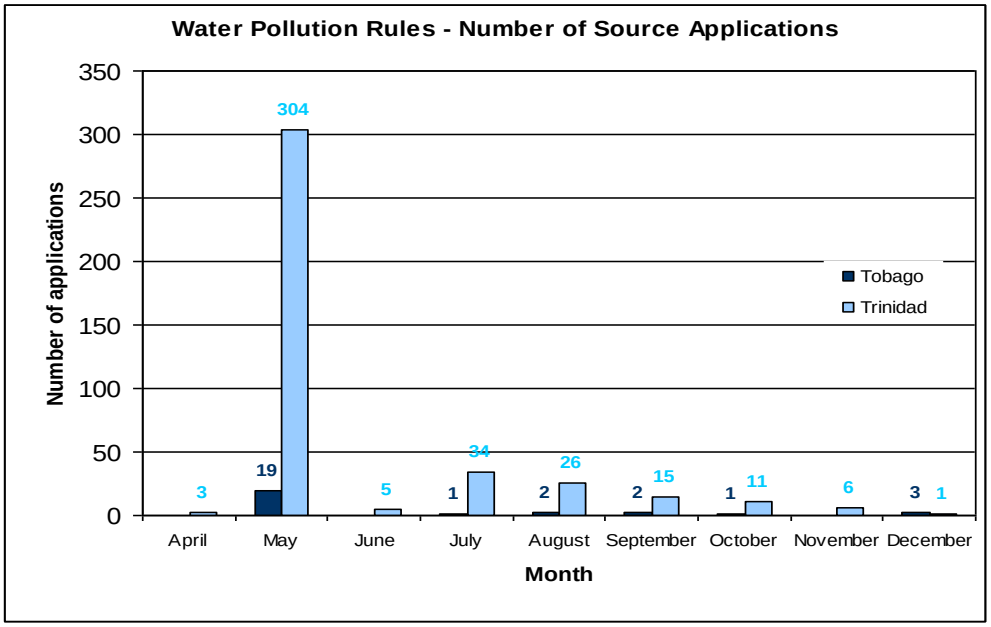
International recognition for Trinidad and Tobago's role in phasing out ozone depleting substances was received in September 2007. The country received an 'Implementers Award' at the Twentieth Anniversary Ozone Protection Awards in Montreal, Canada. The award recognises extraordinary contributions by national ozone units or individuals, whose work at the country level has helped to make the Protocol's phase-out goals a reality.

In Trinidad and Tobago, stakeholder support is key; the *Negative List*, an amendment to the Customs Act, Chapter 78:01 to reclassify Halons in the Customs (Common External Tariff) Order, 1998 and the cooperation of the private sector meant that Trinidad and Tobago is significantly ahead of its planned phase out schedule. As at the end of 2007, all chlorofluorocarbons were effectively phased out locally in terms of use and importation.

- *Clean water*

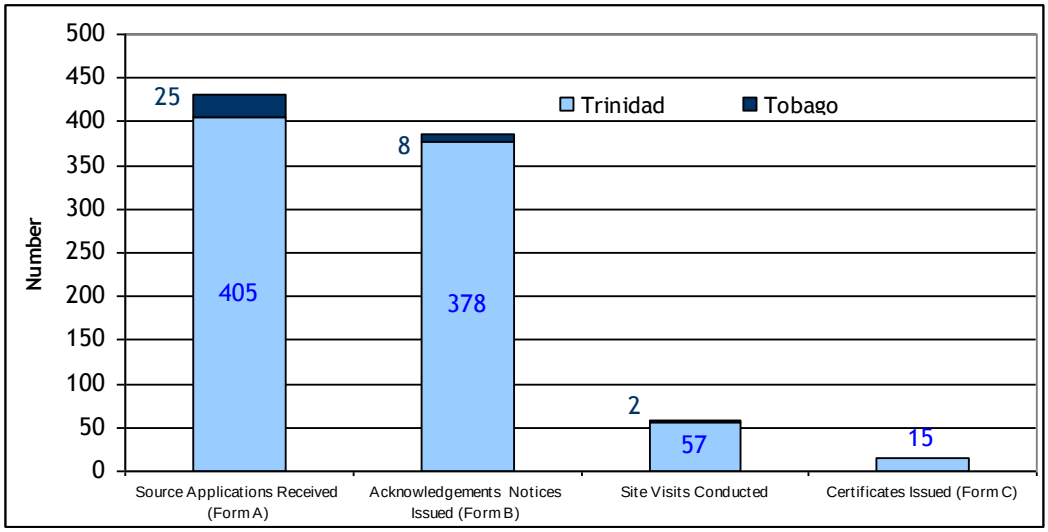
Implementation of the WPR 2001

The bar chart below illustrates cumulative statistics on applications for source registration received; the peak represents the original May deadline established for source registration. Subsequent spikes from July through October are believed to be directly related to public awareness activities during those periods.



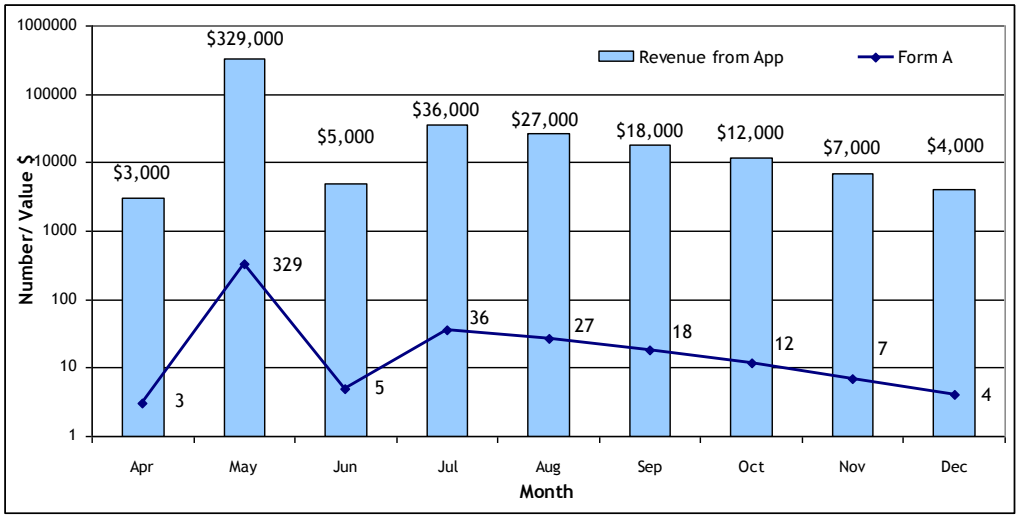
❖ **SOURCE APPLICATIONS RECEIVED OVER THE PERIOD APRIL – DECEMBER 07**

The chart below displays data for the applications for registration received (April to December 2007) in terms of acknowledgments, site visits and registration certificates issued.



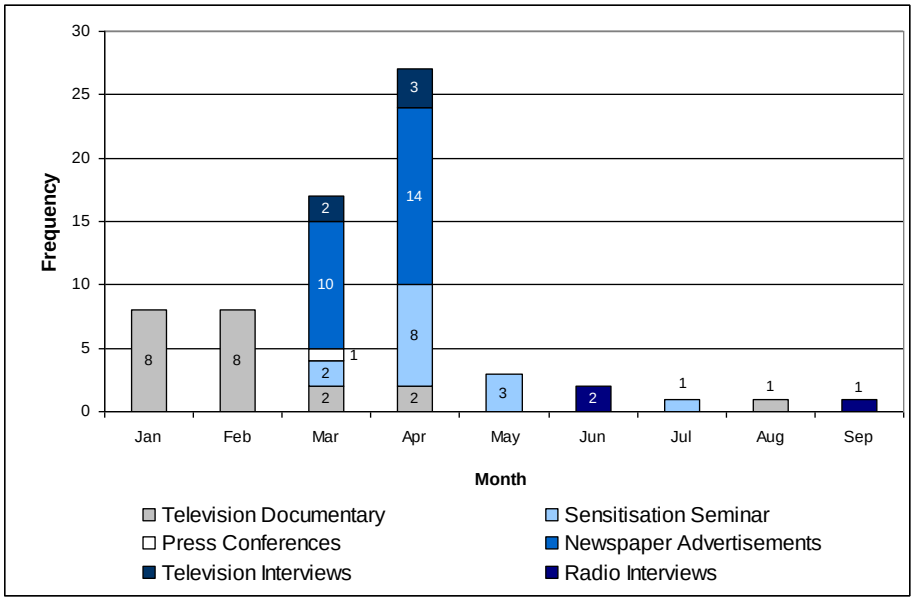
❖ **STATISTICAL REPRESENTATION OF THE SOURCE REGISTRATION PROCESS FOR TRINIDAD AND TOBAGO FOR THE PERIOD APRIL – DECEMBER 2007**

The following chart shows the revenue generated by the source registration applications.



❖ **SOURCE REGISTRATION APPLICATIONS AND CORRESPONDING FEES COLLECTED FOR THE PERIOD APRIL – DECEMBER 2007**

The EMA has prepared a list of non-compliant companies with respect to source registration and intends to issue notification letters to *significant* water pollution sources citing penalties under law and establishing a deadline for compliance should they need to register.



❖ **PUBLIC AWARENESS PROGRAMME JAN-SEPT 2007**

The EMA has worked to develop and maintain relationships with many stakeholders. The result of this relationship building is that the EMA tends to be invited to participate in tenders, committees on related matters, and in the review of information as it applies to water and waste issues.

One of the most noteworthy interactions was collaborating with the EMA's line ministry to identify limitations regarding the Fees Regulations under the Water Pollution Rules.

In another initiative, in June 2007, the EMA met with the Trinidad and Tobago Bureau of Standards (TTBS) to develop a training module for that agency's LABQUIP programme which would ensure that local labs understand and conform to the minimum requirements with respect to the WPRs.

Finally, in June 2007, the EMA participated in Trinidad and Tobago's Local Country Water Partnership's information gathering exercise, as part of an international initiative known as the Global Water Partnership. The Global Water Partnership is a (global) working partnership among all stakeholders involved in water management: government agencies, public institutions, private companies, professional organisations, multilateral development agencies and others committed to the Dublin-Rio principles. The mission of the Global Water Partnership is to support countries in the sustainable management of their water resources. The partnership actively identifies critical knowledge needs at global, regional and national levels, helps design programs for meeting these needs, and serves as a mechanism for alliance building and information exchange on integrated water resources management.

- ***Waste Management***

Remediation of Contaminated Lead Sites at Demerara Road Community and La Chance Trace in north eastern Trinidad continued in 2007. The main aim of this project is to remediate lead contaminated areas in these communities to reduce the risk of lead poisoning.

Over the year, the EMA sought to assess and determine the extent and volume of contaminated lead soil at three sites in Trinidad. Field surveys, soil sampling and analysis were carried out to establish the extent and volume of contaminated lead soil identified from previous studies. A draft final report on the determined volume of lead contaminated soils found at the three selected sites was prepared. Via this project, officers were able to reinforce the use of field screening techniques such as the XRF lead analyser as an effective resource-planning tool for lead remediation projects.

Complementing the above initiative is the ongoing remediation of Demerara Road Community Pond Area (DRCPA) and La Chance Trace (LCT). Civil works at DRCPA

were scheduled to commence in August 2007, but due to inclement weather and inundation at the site, recommendations were made to delay start up. Additionally a request was also made to temporarily/permanently relocate the residents at the remediation site to reduce their health risks. This project is expected to be completed in 2008.

The LCT Interim Project was completed in April 2007. The EMA's recommendation remains to revisit the site and carry out full site remediation as originally intended, which is contingent on the residents being relocated. As with the Demerara Road Community, in order to fully determine the volume of contaminated soil for remedial action planning, the residents will have to be relocated and the current residences demolished. The designation of alternate land use for the site is required because after remediation it may not be suitable for habitation. Decisions on these issues must be made before any further action can be taken.

Geographic Information System (GIS)

The EMA currently uses Global Positioning Systems (GPS) data in GIS applications to analyze and present geospatial information. GPS data were collected during the Blood Lead Level (BLL) survey, ground water quality assessments and currently during source registration for the Water Pollution Rules in 2007.

In 2007, the EMA engaged in the collection of data to facilitate the development of an *enterprise-wide* GIS database.

- ***Noise Management***

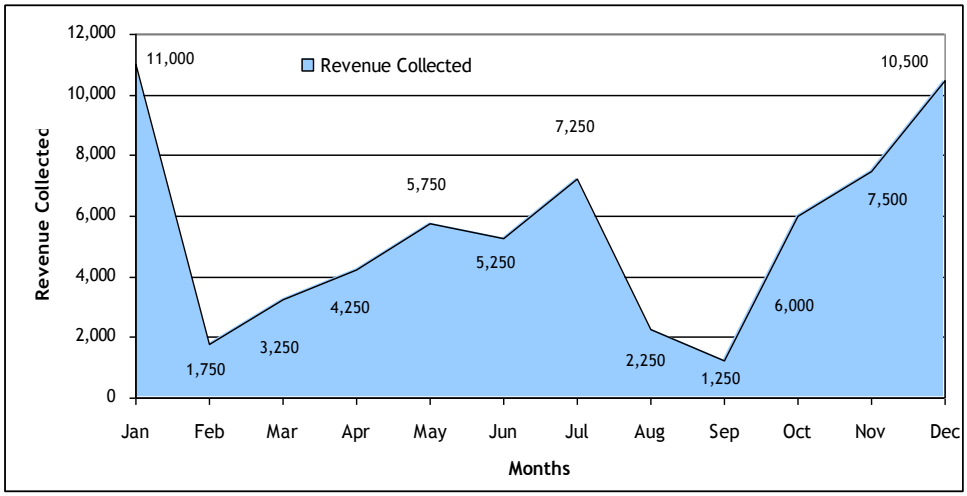
A Code of Practice was developed for the Entertainment Industry in 2003. The code intends to enable the EMA to emphasise and promote enforcement of all noise control legislation, so that the legal rights of all interest groups can be managed in accordance with the law.

To ensure efficient and effective implementation of NPCR (2001), the EMA has regularly engaged in training and retraining of internal staff, the Environmental Police Unit (EPU), the Department of Natural Resources and the Environment in Tobago (DNRE) and other stakeholders in the measurement of sound pressure levels to measure compliance with the Noise Standards. The objective of training these officers is to expand the ability of the EMA to respond to Noise Related Complaints.

EPU officers monitor sound pressure levels at events which have received *noise variations* to ensure that they comply with allowed levels. On the other hand, *noise complaints* received

from the public are monitored by both the EMA and the EPU. With an average of 17 complaints received per month and an average resolve rate of fewer than six per month, the overall rate of new complaints to resolution is approximately 3:1.

A total of $66,000 was collected from application processing fees in 2007, see figure below. The EMA is currently unable to confirm if the existing application fee of $250.00 covers full operating expenses for this process.



❖ **APPLICATION FEE REVENUE COLLECTED UNDER THE NOISE POLLUTION CONTROL RULES (2001) IN 2007**

Implementation of the NPCR 2001

The timelines and requirements for these permits are outlined within the Rules and the process to execute the Rules can be considered to be mature with predictable peak times around *November – December - January* of each year. It has been found that the public has a fair understanding of the requirements of this law, but the EMA continues to make attempts to boost public awareness efforts around peak times.

The EMA and the Auditory Unit of the Ministry of Health jointly embarked on a project in mid-2007 to determine the level of noise to which school-aged children are exposed. This was considered an important project as it has been scientifically found that unwanted noise and loud sounds can lead to hypertension, increased irritability, increased risks to persons recuperating from illness or to those with heart diseases, learning impairment, and temporary or permanent hearing loss from continuous exposure. The purpose of this project was to ascertain what environments can be hazardous to auditory

health and what type of mitigation measures could be put in place to counteract any negative situations arising.

A background noise survey was done during the months of July - August 2007 in vacant classrooms in more than 70 schools throughout Trinidad and Tobago by EMA's Compliance officers. The second phase of the project would be to determine the noise levels during school time for comparison. Readings will also be done around Carnival events, highways, and busy city streets also to determine existing noise levels. Following these exercises, based on the data collected, mitigation measures will be matched to the existing situations.

At present, the EMA's objective is to ensure that all noise complaints received are investigated within a one-week period with voluntary compliance being the first option.

The Authority continues to maintain close interactions with the EPU in the execution of the responsibilities as defined under the Rules.

- ***HEALTHY ECOSYSTEMS***

Under the Environmentally Sensitive Areas Rules 2001, a total of eight areas across Trinidad and Tobago have to date been identified (through consultation with stakeholders) as areas which meet the criteria for designation as environmentally sensitive.

Out of the eight areas, three have so far been designated:

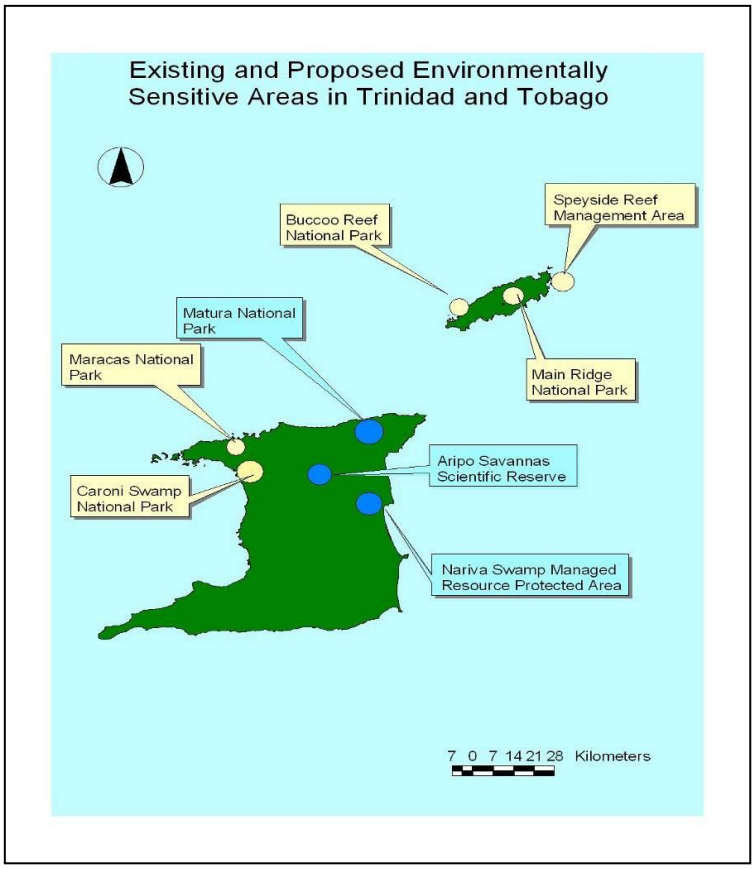
- The Matura National Park in 2004;
- The Nariva Swamp Managed Resource Protected Area on December 29th 2006;
- The Aripo Savannas Scientific Reserve in on June 5th 2007.

Groundwork began in 2006 on two other areas - the Main Ridge National Park and Caroni Swamp National Park, and continued into 2007. Technical Briefs for these areas were prepared between 2006 and 2007, and Legal Notices were prepared for the two areas in January 2007. Cabinet approval was received to proceed with designation of the Main Ridge National Park, but this designation has been put on hold until the EMA receives verification of the ecosystem's boundaries from Lands and Surveys Division. Information on the Caroni Swamp continues to be compiled in order to seek Cabinet approval.

Another area identified for designation is the Buccoo Reef Marine Park, which has been a part of the EMA's work programme for at least five years. At present, a survey of the high water mark to determine the landward boundary of the ecosystem is being undertaken. Designation is expected to be approved by Cabinet once these boundaries are

agreed on by the Tobago House of Assembly, and then approved by the Lands and Surveys Division.

Future priorities include research into the preparation of Technical Briefs for the Maracas National Park and the Speyside Reef Management Area.



❖ **GENERAL REPRESENTATION OF THE EXISTING AND PROPOSED ENVIRONMENTALLY SENSITIVE AREAS IN TRINIDAD AND TOBAGO**

Species

Species selected for designation over the period 2003 – 2007 in consultation with stakeholders include the:

- West Indian Manatee;
- Trinidad Piping Guan or Pawi;
- White-tailed Sabrewing Hummingbird;
- Five species of marine turtles, including Leatherback, Green, Hawksbill, Olive Ridley and Loggerhead;
- Ocelot;
- Golden Tree Frog;

- Silky Anteater;
- Bloody Bay Poison Frog;
- Scarlet Ibis;
- All orchids;
- Goliath Grouper;
- River Otter or Neotropical Otter;
- Stony Corals;
- Black Coral.

Prior to the 2006/2007 period, three species were designated - the West Indian Manatee, the Trinidad Piping Guan or Pawi, and the White-tailed Sabrewing Hummingbird.

From the list, the EMA sought Cabinet's approval for the designation of the Ocelot, Golden Tree Frog and Stony Corals in April 2007. Stony Corals were rejected for reasons given below, while the Ocelot and the Golden Tree Frog were approved for designation. Draft Legal Notices for the two approved species were developed in July 2007 and forwarded via Legal Services to the Chief Parliamentary Council for review and comment.

Stony corals are found in reef areas such as the Buccoo Marine Park, Speyside and other reefs in Tobago. It is assumed that Cabinet may have considered the species already protected due to the legal protection afforded under the Marine Areas Preservation and Enhancement Act (Ch 37:02 Section 3, 14 June 2007). The species occurs in areas other than the Buccoo Marine Park, which is the only marine area referred to under the Marine Areas Preservation and Enhancement Act 1970. This species is considered important for protection as an Environmentally Sensitive Area because coral reefs within Trinidad and Tobago, and around the world are threatened due to coral bleaching incidents, anthropogenic activities such as land based pollution runoff, and development of coastal and inland areas.

Research on Matura National Park began in 2004 and was completed in April 2007. Research was facilitated by the University of the West Indies, St Augustine by Dr Veerle Van den Eynden, Ms Elisha Naranjit, and communities that border the park in north-eastern Trinidad.

A Research Seminar was held in March 2007 to present findings and begin development of a research agenda. Final reports were submitted in April 2007 and circulated to other stakeholders. The final report was submitted to the EMA by the University of the West Indies and M2M (Matura to Matelot) Network National Parks Section – Forestry Division in April 2007 and circulated to stakeholders such as the local community, community based organisations and the community research team.

The EMA continued the supervision of the establishment, development, support and capacity building for the existing Environmentally Sensitive Areas and it attempted to continue the work of the Biodiversity Advisory Council. Existing committees include:

- MATURA STAKEHOLDER MANAGEMENT COMMITTEE
- BUCCOO REEF COORDINATING COMMITTEE
- ARIPO SAVANNAS STAKEHOLDER MANAGEMENT COMMITTEE

The Matura National Park Stakeholder Management Committee is the most mature SMC and has already developed a management plan for the Area. This SMC of the EMA has evolved to adopt participatory planning as this may be a more effective management tool. This committee is currently being chaired by the Forestry Division.

The Buccoo Reef Coordinating Committee, now chaired by the Tobago House of Assembly (THA), met regularly and engaged in a Visioning Workshop in June 2006 - this was facilitated by THA and CANARI. Throughout the year, stakeholder input allowed several management issues to be realised and the boundary issue of the high water mark was examined in depth with suggestions for the way forward, as discussed previously.

In 2007, as the newest SMC and despite capacity constraints, the Aripo Savannas Stakeholder Management Committee was heavily involved in participatory management planning and capacity building under the Update of the Aripo Savannas Management Plan (1980) project. Given the constraints faced by this SMC, their achievements are considered commendable.

The EMA approached the Cabinet-appointed National Wetlands Committee to become the SMC for both the Nariva Swamp Managed Resource Area and the Caroni Swamp National Park given that the majority of proposed SMC members for both areas are present on the National Wetlands Committee.

In 2005, The University of the West Indies, St. Augustine was contracted to execute a research project on the White-tailed Sabrewing Hummingbird. Project principals include Dr. Adrian Hailey, (Lecturer,) and Ms. Daveka Boodram, (M.Phil. Candidate). The objective of this project is to determine population size, demographic parameters, habitat requirements, possible habitat range and to develop a GIS map showing the spatial distribution of the species. Fieldwork was completed in January 2007, and the student is expected to submit the final product at the end of January 2008. This final report is expected to include a management

and recovery plan for this species, in addition to research findings on the species. Two hundred and eight birds were banded during the course of the study.

❖ **WHITE-TAILED SABREWING HUMMINGBIRD (PHOTOGRAPH BY: DAVEKA BOODRAM)**

The Authority initiated research on the Trinidad Piping Guan or Pawi in January 2007. This project is being facilitated by the University of the West Indies, St Augustine. The first conservation efforts for this species arose in the 1980s, involving the implementation of an Environmental Education Campaign, however, it has been suggested that the difficulty faced by the species is so acute that urgent measures are required to safeguard its future.

Two sites, Grande Riviere and Morne Bleu, are being monitored to determine the behaviour and habitat use of Pawi. Researchers are beginning to recognize individual birds and have noticed regular visitation of specific sites. A radio tracking receiver and transmitters were obtained using the additional grants, and a permit to catch three Pawi for radio tracking has been granted by the Wildlife Section of the Forestry Division.

The EMA has been able to support and/or enable the country in meeting its obligations under various Conventions and Protocols. These included:

RAMSAR:

Trinidad and Tobago acceded to the Ramsar Convention on Wetlands in 1993. Soon after, the Nariva Swamp was designated in December 1992 as a wetland of international importance, (Ramsar site no. 577). Through the management of the

Nariva Managed Resource Area, the EMA is able to support Trinidad and Tobago's obligations to the Ramsar Convention.

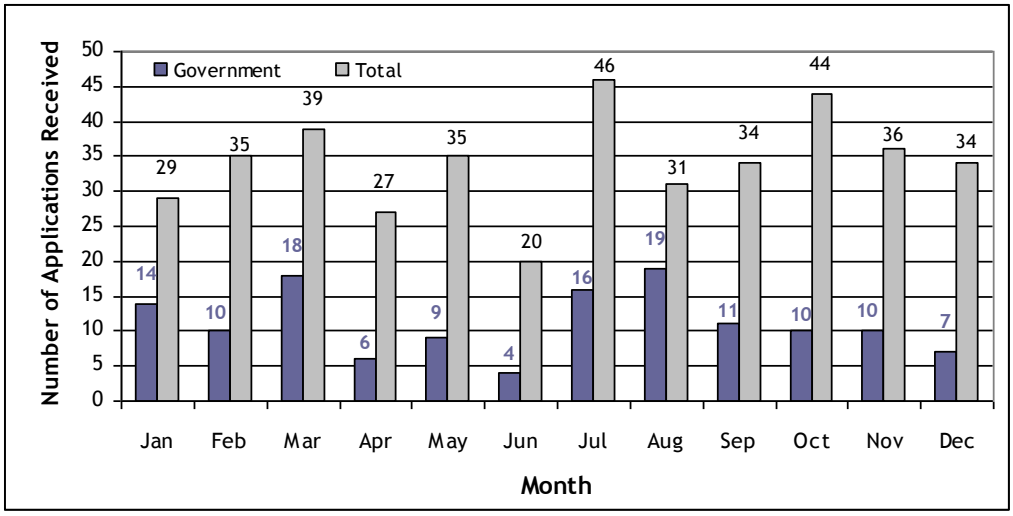
Implementation of the CEC Rules (2001)

In 2007, the EMA experienced a significant increase in both the number of in-coming applications and in the complexity of applications submitted. CEC statistics for 2007 are shown below. Four hundred and one applications were received, nine were refused and 218 certificates were issued. The process earned a total of TT$1.425M, which was directed into the administration of the process and the sourcing of technical expertise to assist in the review process of EIAs.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
CEC applications received	30	35	39	27	35	21	46	31	34	46	34	23	**401**
CECs Issued to date	15	17	13	22	26	16	22	13	17	25	16	16	**218**
CECs Refused	0	1	0	2	0	1	1	1	0	2	0	1	**9**
Applications requiring EIA	5	5	3	3	2	1	2	1	0	3	1	0	**26**
CEC/EIA applications finalised	0	0	0	0	0	0	0	0	0	0	0	0	**0**

❖ **CEC STATISTICS (2007)**

There was also a notable increase in the number of government applications submitted, and these tended to involve large scale development projects such as infrastructure for an intra-island ferry service, cross-country highways, large scale housing developments, development of fishing ports in rural areas and large and medium scale agricultural development.



❖ **GOVERNMENT APPLICATIONS COMPARED TO THE TOTAL NUMBER OF CEC APPLICATIONS SUBMITTED - 2007**

Applications of Note - 2007

Some of the more significant CEC applications received and processed in 2007 included the following:

TOBAGO

⇢ **1127/2005, 1293/2005, 1320/2006 –** Application for the conduct of a 3D seismic survey at Block 22, off Tobago by Petro-Canada and subsequent drilling of wells in Block 22. This was significant as it represented the first time that such projects were proposed off Tobago since the CEC Process began.

⇢ **1274/2005** – Application for the first leg of the proposed Eastern Caribbean Gas Pipeline by the Eastern Caribbean Gas Pipeline Company Limited. This proposed project involves the development of a pipeline serving seven islands - Barbados, Grenada, St Vincent, St Lucia, Martinique, Guadeloupe and Dominica.[27] This application is a first for the EMA in terms of the traversing of international boundaries, and is currently being processed.

[27] *Extracted from Alexander's Gas & Oil Connections News & Trends: Latin America from an article by Petroleumworld on 12-09-04 entitled: Eastern Caribbean gas pipeline project accomplishes major milestone. Available from: http://www.gasandoil.com/goc/news/ntl44030.htm*

- **2033/2007** – Application for the establishment of a pipeline system from the East Coast of Trinidad to Cove Estate, Tobago. This will be the first time that a project is proposed for a gas pipeline to Tobago.

MORUGA

- **1676/2006** - Drilling programme for the Moruga and Balata East Fields by Petrotrin – this is significant as it represents a combined application for two separate blocks in two different areas, but which have similar environmental receptors making it acceptable for EMA to review these under one application. Another significant aspect is that Balata East is just south of the designated Nariva Swamp Managed Resource Area. The final TOR was issued in early 2007.

UNION ESTATE

- **1033/2005, 1516/2006, 1982/2007, 2085/2007** - Application for the establishment of an aluminum smelting facility at Union Industrial Estate by NEC, subsequent application for a power plant to provide energy to the smelter and port development to support the Smelter. In addition, an application for a construction work camp for 1,500 workers was submitted, this was the first time that an application for a smelter was approved and this is the first time that an application was received for a construction work camp. As discussed in Chapter 2, the issue of the CEC for the smelter was one of the more controversial decisions taken by the EMA to date.

- **1254/2005** - The establishment of an Ammonia/Urea Ammonium Nitrate/Melamine (AUM) Downstream Industrial Complex for the production of Urea Ammonium Nitrate 32 (UAN 32) solution by Melamine Methanol Holdings Limited. All CECs are issued to specific activities at specific locations and this application is of interest because after the CEC was granted, the applicant began seeking to relocate the plant.

- **1438/2006** - Guapo Shoreline Protection Project at Guapo Beach by ALNG. This project was of interest to the EMA as it represented a large-scale attempt to stabilise the Clifton Beach area.

PT LISAS

- **1247/2005** - Essar Steel was issued a CEC for the establishment of the iron and steel complex in Claxton Bay and which is contingent on the issue of CEC 1761/2007. Post issuing of the CEC, complaints have been received from the public regarding the establishment of the complex.

- **1761/2007** - NEC Port Development at Pt. Lisas and expansion of the Pt. Lisas Industrial Estate to facilitate use by Essar Steel. This is expected to conflict with CEC 1250/2005 already awarded to Trinidad Energy Investments Limited (TEIL) for land clearing because part of the proposed industrial corridor traverses the land covered in CEC 1250/2005.

CENTRAL TRINIDAD

- **1486/2006 -** Modification and Realignment of the Caroni River from Centeno Bridge to the Uriah Butler Highway by NIDCO; any project proposing realignment of rivers is considered significant particularly when it involves the largest river course through areas that experience significant flooding on a yearly basis.

SOUTH TRINIDAD

- **1121/2005 -**Establishment of a highway from San Fernando to Princes Town by the Ministry of Works and Transport; this is significant as the proposed highway traverses forested areas, oil fields and communities. Relocation of communities is expected if the project is approved. This is currently at the EIA stage.

- **1143/2005** - The extension of the Solomon Hochoy Highway to Point Fortin – the Golconda to Debe Segment, from Golconda to the intersection of the M2 Ring Road with the SS Erin Road in Debe by Ministry of Works and Transport. For reasons similar to 1121/2005, this is significant as the proposed highway traverses forested areas, etc.28

28 A helicopter fly-over the proposed highway routes from San Fernando to Mayaro and San Fernando to Point Fortin. This was an excellent opportunity for officers to view of the routes and gain a bird's eye view of affected receptors.

- **1877/2007 -** Laying of transmission pipelines and their appurtenances and associated infrastructure for the Rio Claro/Mayaro Water System at Dades Trace Rio Claro to Agostini Village by WASA; this proposed project is expected to cause significant road and infrastructure disruptions.

EAST TRINIDAD

- **1632/2006 -** UTT Campus, Wallerfield; this proved to be an interesting application due to its size and location within an industrial estate which is itself in an environmentally sensitive area.

- **1633/2006 -** Establishment of a Residential and Commercial Business Centre along Toco Main Road, Sangre Grande by Vision City Limited; this application was of particular interest due to its size and possible impacts on existing infrastructure.

- **1884/2007 -** Development of 14.1 Ha for residential purposes at Mon Espoir Estate, Mausica, D'Abadie, this application was refused as the baseline was constantly being changed by the applicant. This application paved the way for policy development as it relates to the granting or refusing of applications.

- **2046/2007 -** Ancillary works required for the completion of the PriceSmart including paving and establishment of a sewage treatment plant in Mausica; as discussed in Chapter 2, this was one of the highlight applications of 2007 as the applicant submitted an application in August 2007 and began construction without a CEC being first issued. The applicant was fined $350,000 for breaching the CEC Rules.

PORT-OF-SPAIN AND ENVIRONS

- **1218/2005 -** The establishment of a heliport at Audrey Jeffers Highway, POS by National Helicopter Services Ltd. This represented the first heliport application received by the EMA.

- **1653/2006 -** Upgrading of Infrastructure and access on Macqueripe Bay, Chaguaramas, by the Chaguaramas Development Authority (CDA), this was deemed of interest to the EMA due to the upgrade works proposed, the type of location and the popularity of the area.

- **1749/2005 -** Establishment of a landing facility for submarine cables at Macqueripe Bay and an underground duct from the bay to Chaguaramas by Southern Caribbean Fiber Limited; this was of interest as it was the first time the EMA dealt with such an application.

- **1657/2006 -** The establishment of temporary site for a media compound, broadcast compound, hospitality village and accreditation centre at King George V Park, St. Clair, Port-of-Spain for Cricket World Cup (2007) Limited; this was a significant application due to the international and national interest and the fact that it was the first time the EMA dealt with such an application.

- **1708/2006 -** Installation of replacement Floating Dock facility in Chaguaramas by Caribbean Engineering & Dockyard Services Limited; the EMA felt that this was significant as it was the first time dock management and waste management issues of this kind were reviewed.

Monitoring

From February to December 2007, two hundred and twenty two CEC-related complaints were received, the most significant was associated with the PriceSmart issue previously mentioned.

Significant time is being invested by the EMA to monitor the site upon which the Alutrint Aluminum Smelter Complex is being built on a weekly basis. Each week, a senior Compliance Officer visits the site to inspect the work being carried out. This was a strategic decision by the EMA to devote resources to monitoring this highly controversial application.

STRATEGIC ENVIRONMENTAL ASSESSMENT - In an effort to promote the use of Strategic Environmental Assessments (SEAs) as a decision-making tool in Trinidad and Tobago, the EMA embarked on a pilot project to define the North Coast Marine Area (NCMA) system (through identification of its boundaries and system components) in order to assess current information available on the NCMA and to determine the scope of work for implementation of an SEA study in the NCMA. Consultant ABP Mer was contracted in September 2006 to conduct this exercise. Due to budget restrictions, in 2007 the final outcome was limited to two reports, a Methodology Report and a Scoping Report that outline the resources required for this exercise and recommendations for the way forward with respect to SEA in Trinidad and Tobago.

SLOPE STABILITY MANUAL - The EMA commenced development of a Slope Stability Manual in 2005 and the final technical manual was submitted in 2007. There were several delays on this project and the consultant did not meet the deliverables to produce a Public Guide or to deliver appropriate training to officers. The Authority is currently identifying another consultant to facilitate a training workshop for staff and to draft a public guide to inform CEC applicants about slope stability issues and related impacts.

CEC PROCEDURES MANUAL - As part of the process to document and standardize procedures the EMA continued work on the drafting of the CEC Procedures Manual. This project continued throughout 2006 since it required that every detail of each step in the CEC process be captured in writing. A first draft was completed in 2007 and is currently being reviewed.

CEC DATABASE - One of the recommendations from the CEC Audit conducted in 2004 was the establishment of a database to administer all aspects of the CEC process, such as electronic entry, evaluation, response and tracking of all CEC applications received. The scope and purpose of the database was developed in 2005 to assist in the making of a prototype. The EMA established a testing group in late 2007 to test the said prototype and provided feedback.

CEC FORM A - CEC Form A remained unchanged since July 2001 and over time it was realised that an assessment of the form to determine its effectiveness was required. Discussions were held with stakeholders in 2004-2005 to obtain feedback on the effectiveness of the form. Comments were used to amend the form, and samples of Form A for select Designated Activities were also produced. The revised Form A and Sample Forms are expected to be finalised in January 2008. Once the revised CEC Form A is approved, stakeholders will be notified and the form will be tested over a three-month period, after which its effectiveness will be re-assessed.

CEC CERTIFICATE AND CONDITIONS - The format of the current CEC Certificate is being reviewed and assessed based on officer feedback. An audit of existing conditions by Designated Activity was started in 2007 and included a review of a sub sample of CEC Certificates to identify and extract relevant conditions. The content of these conditions was assessed, amendments proposed and/or new conditions were developed. Arising out of this project, the development and/or revision of CEC conditions now requires that they be reviewed and discussed with relevant staff prior to implementation.

SITE VISIT REPORT FORM - A site visit report form was developed in 2003-2004 to ensure that officers document findings and observations made on site visits, and to ensure consistency in how visits are conducted. The format was reviewed in 2007 incorporating

feedback from officers who use the form on a regular basis. A revised version is currently being tested. The revised form will be further re-assessed after testing is complete. The EMA proposes to develop two versions of the site visit report, one to be used for energy applications and another to be used for non-energy or general applications.

CEC CONDITIONS / COMPLIANCE ASSISTANCE PROGRAMME (CAP) DOCUMENT –In 2007, the EMA embarked on an intensive process to review all CEC designated activities with a view to preparing documents that will assist both applicant and officer in understanding the issues associated with a particular activity. This project was managed by a CAP Brainstorming Group and Independent Working Groups. A final draft guideline document for designated activity 8, which deals with land clearing, was prepared and will be submitted for final approval in January 2008. Final draft guideline documents for activities 24–29 (oil and gas exploration, production, pipeline systems, refining and storage); 12 (land reclamation); 13 (coastal or offshore construction) and 34 (water catchment and treatment) are also being prepared.

The CEC Conditions project is being conducted simultaneously with the CAP project to ensure that all information related to designated activities is consistent. The task is very intensive and requires a substantial amount of dedicated time. An assessment of work conducted to date was done in December 2007 to determine lessons learnt.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) AUDIT - The CEC process has been in existence for almost seven years, and although an audit of the entire CEC process was conducted in 2004, it was recognised that there was a need to audit the EIA aspect. The EMA realized the need for an external independent party to conduct an audit of the EIA process. This was commissioned in the latter half of 2007. Findings and recommendations are expected in February 2008 and the EMA will meet with stakeholders and source feedback on the results of the audit.

EIA PRELIMINARY REVIEW CHECKLIST - An EIA Preliminary Review Checklist was developed to standardise the procedure for determining if an EIA submitted by an applicant could be accepted. The checklist assists in screening EIAs and focuses on administrative requirements such as formatting and inclusion of maps and a first level technical review. This document is important in providing guidance to the processing officer and it allows for early identification of potentially deficient EIAs. Development began in 2006, and in 2007, a final document was produced.

EIA REVIEW AND ASSESSMENT REPORT - The EIA Review and Assessment Report, which the EMA produces after the review of an EIA, was revised in 2007. The Authority sought to separate the Report into critical issues on which a decision for granting/denying the CEC would be based, and it also included other issues that would boost the quality and completeness of the document. While the latter aspect may appear trivial, it is the EMA's position as reviewers of EIAs, that the current quality of documents produced needs improvement as the EIA process allows the Authority to publicly address deficiencies as a means of boosting local capacity to produce EIAs of a higher quality.

DRILLING DISCHARGE WORKING GROUP - The EMA finalised consultations with service providers for the management of drilling wastes and met with MOEEI to decide way forward on this matter. A decision was taken to submit a Cabinet Note through the MOEEI.

CUMULATIVE IMPACT ASSESSMENT (CIA) GUIDES - In light of the recent, rapid increase in development activities locally, the EMA began exploring CIA as a tool in decision-making. The development of a CIA Practitioner's Guide commenced in 2007 and this is expected to be completed by February 2008. The end product will include a guide and training sessions outlining procedures for dealing with cumulative impacts of projects. Again the Authority will meet with stakeholders and source feedback on the results of the project.

FINANCIAL MECHANISMS AND ENVIRONMENTAL COMPLIANCE – In 2007, the EMA sought to identify financial mechanisms that can be utilised through the CEC Process to ensure environmental compliance. It is expected that dialogue between the financial services sector and EMA will allow for the incorporation of environmental compliance as a pre-requisite to the granting of loan facilities. The output will be a written policy which will enhance the management of the environment through the implementation of financial assurances or environmental bonds in a CEC. Thus far, the EMA has initiated contact with the Association of Trinidad and Tobago Insurance Companies (ATTIC). This project is expected to be finalised in 2008.

RISK ASSESSMENT GUIDELINES - Like EIAs and CIAs, Risk Assessments are an important tool used in analysing the feasibility of applications, particularly those related to the energy sector. The EMA laid the groundwork for providing guidelines for applicants where their applications require Risk Assessments and also for building the capacity of the staff to utilise such tools in their decision making. Through a project initiated in 2007, the Authority is seeking the development of guidelines:

- to determine when a Risk Assessment is required and the potential risks involved
- to determine what type of Risk Assessment is required (qualitative, quantitative, a mix of qualitative and quantitative, other options)
- for drafting a Terms of Reference (ToR) to request a Risk Assessment
- for regulators to review the Risk Assessment report

Risk Assessment is a highly specialised field requiring expert services and the EMA is seeking to initiate contact with the University of Trinidad and Tobago to explore the possibility of achieving the objectives of this project within existing budget.

Other Collaborations

OSH AGENCY, MINISTRY OF LABOUR - The EMA has developed a working relationship with the OSH Agency of the Ministry of Labour. On more than one occasion the EMA has sought and obtained assistance from OSH Agency in dealing with problems which did not fall under the mandate of the EMA, but for which the Authority had an interest. One such example was an incident at the YARA facility which involved a sulphuric acid spill, and the EMA requested that OSH Agency visit and advise on whether appropriate remedial measures had been taken. Another notable case involved the UNICELL (Paper Factory), where OSH Agency visited and delivered a report to the EMA on the facility. This report was used to determine how closely the company was adhering to the conditions of its CEC. The EMA hopes to continue to build on this relationship in the future.

REGIONAL CORPORATIONS – In 2008, the EMA is expected to strengthen its relationship with the Regional Corporations. Technical officers will be assigned to a Regional Corporation and will liaise with a contact person at the Corporation on issues of concern

to the EMA and to the Corporation that may be occurring in the particular district. This focus is expected to result in faster communication between the two entities in a manner that will be mutually beneficial to both agencies. An assigned officer will attend the monthly meeting of the Corporation and collect matters for investigation as well as report on matters that were undertaken over the previous month. It is hoped that this will allow for a broader yet more focused country coverage.

LAND RECLAMATION, NORTH WEST TRINIDAD – The EMA received a report in 2007 on illegal land reclamation that has been taking place on the NW peninsula in Trinidad since 2001. The Authority is attempting to meet with the Cabinet-appointed Land Reclamation Committee to discuss the findings of the consultant and to design a way forward. This is proving to be very difficult. This meeting is essential to ensure that the committee and the EMA do not contradict each other in decision-making.

3.0 PLANS FOR 2008

3.1 Legal Services

Legal Services plans to:

- Submit the Notices designating the Golden Tree Frog and the Ocelot as environmentally sensitive species for stakeholder and public comment;
- Submit the draft Waste Management Rules for stakeholder and public comment;
- Prepare defence as the named Respondent in the Alutrint judicial review matter;
- Continue pursuing enforcement action against violators of the EM Act.

3.2 Corporate Relations and Public Education

Media Campaigns

A media campaign for television is being developed called "Trini Lifestyle". These features will focus on everyday practices that have adverse impact on our environment.

EMA Radio series

The "Talking Green" radio series is designed to give members of the public an insight into the work of the EMA. Each 30-minute programme will include an interview with EMA personnel on a specialized topic, as well as environmental news and tips.

Schools Programmes

The Eco-Song competition will be introduced in 2008 to fill a void in environmental educational activities for students in Forms 1 to 3. The focus in this inaugural year will be the pressing environmental problem of Global Warming and Climate Change. Students will be given the opportunity to articulate their views on this topic among their peers and their teachers through music and song.

The other two schools' competitions, the Primary Schools' "Hands-on" Environmental Competition and the Secondary Schools' Dramatic Envirologue Competition, will be held for the 10^{th} year. These competitions continue to encourage environmental education among students in the primary school system and in Forms 4 to 6, respectively.

Community Outreach

CR/PE will continue to work with Technical Services towards improving public engagement in the Certificate of Environmental Clearance (CEC) process.

This began with the Alutrint and Alcoa projects and then extended to CR/PE being involved in the critique and promotion of public engagement in the CEC process with reference to specific applications that were high-profile or significant. These projects will include The Mayaro-Princes Town Highway, Vision City and PriceSmart in Mausica.

The EMA will also strengthen its links with the umbrella organization Council of Presidents of the Environment (COPE) to promote Civil Society Organisation involvement in public comment on Environmental Impact Assessments (EIA) through the provision of training sessions and ongoing support. CR/PE will continue to play a key role in the public engagement aspect of the Compliance Assistance Programme (CAP).

World Environment Day

The EMA will continue to spearhead activities to commemorate World Environment Day (WED), 2008. Plans will include the following:

- A three day conference that will bring together key experts to discuss the WED theme;
- Exhibitions at shopping malls throughout Trinidad and Tobago;
- The annual "Green Leaf" Awards Ceremony.

3.3 Technical Services

Clean Air

Ultimately, the area of air pollution management in Trinidad and Tobago is one that requires an iterative approach with more research accompanying and reinforcing the implementation of legislation. In addition, more monitoring stations are required to develop an effective air quality monitoring network in order to assess potential impacts of air pollution on human health. The Environmental Management Authority (EMA) received a Certificate of Environmental Clearance (CEC) application (CEC 1033/2005) on 25th April, 2005 for the construction and operation of an aluminium complex (Alutrint Ltd) at Union Industrial Estate, La Brea.

In 2008, the EMA will undertake the development of an air quality monitoring station. A project is being currently being initiated to identify, shortlist, evaluate and select possible locations most suited for the deployment of the Ambient Air Quality Monitoring station.

Clean Water

The EMA is now focused on building internal capacity to facilitate the administrative process of implementing the Water Pollution Rules. As such, the Authority has identified a number of areas for training in 2008:

- Permit writing;
- Auditing and Inspecting;
- Development of Water Quality Standards;
- Non-Point source Pollution Control;
- Wastewater treatment techniques and application;
- Industrial processes for specific industries;
- Sampling techniques, analytical test procedures, quality Assurance/quality control procedures for effluent monitoring data, data interpretation and analysis.

The EMA aims to raise awareness about the problems associated with Non Point Source (NPS) pollution and establish the linkages of NPS pollution as it impacts on environmental water quality and the public health of recreational water users in Trinidad and Tobago. The EMA will develop a NPS draft and a vulnerability rating for watersheds for point and non point source pollution management in 2008.

Waste Management

The National Hazardous Waste Inventory is expected to be repeated in 2008. Lead characterisation and remediation are expected to continue in Demerara Road until the site is completely remediated.

Geographic Information System (GIS)

Within the EMA, data is increasingly being requested for the purposes of evaluation and assessment in order to make critical decisions with respect to:

- The granting of noise pollution variations under the Noise Pollution Control Rules (NPCR)
- The Certificate of Environmental Clearance Rules (CEC) and associated EIAs
- Source registration and permits under the Water Pollution Rules (WPRs)
- The declaration of environmental sensitive areas and species (ESAS) under the ESASs Rules.

Based on the results of a GIS needs assessment survey executed in 2006, GIS applications will be developed by a consultant to suit the internal needs of the EMA. This project is expected to continue into 2008 and will be carried out in several phases for a period of years.

Healthy Ecosystems

Trinidad and Tobago has significant forest resources, with an area of approximately 240,000 ha (47%) of forested lands. This consists of thirty-six (36) legally constituted Forest Reserves, State Lands under forest cover and forested private lands. However, information on the forest resources for Trinidad and Tobago is out of date, as the last inventory was conducted in 1980. Since then, the extent and condition of the forests have changed, people's needs and expectations for forest management have evolved and new stakeholders have emerged with a legitimate interest in the future of forests. The Forestry Division in collaboration with the EMA contracted The United States Department of Agriculture Forest Service to update the forest cover maps and perform an assessment of forest cover as the first phase of the National Forest Inventory for Trinidad and Tobago. It is expected that this project will commence in 2008 for completion in 2011.

Research on the West Indian Manatee is a project that the EMA hopes can be resourced in the near future. The EMA has started the process of developing management plans for several of the eight Areas so far identified.

In the next two years, it is expected that the Buccoo Reef Marine Park would be declared an ESA, followed by the designation of Main Ridge National Park and Caroni Swamp National Park. Also, over the next two years, it is expected that the Ocelot, Golden Tree Frog and the Bloody Bay Poison Frog will be designated as environmentally sensitive.

Preliminary work on the Nariva Swamp Restoration and Carbon Sequestration Initiative was funded by the World Bank since 2006. In 2008, the EMA will undertake the first phase of this project which involves planting 5 hectares of land. The establishment of the project nursery will commence to ensure that plants will be available from 2009.

Environmental Assessment

The CEC Form A remained unchanged since July 2001 and over time it was realised that an assessment of the form was required to determine its effectiveness. The revised Form A and Sample Forms are currently being developed and should be finalised in January 2008.

It is expected that a greater number of more complex applications will be received by the EMA for processing, hence future projects will therefore focus on improving the efficiency and effectiveness of the CEC process and building the technical capacity of the organisation to deal with the management of the environmental impacts of development.

The EMA hopes to complete the CAP documents in 2008. The documents include:

- Land clearing;
- Agriculture;
- Automotive;
- Biodiversity;
- Oil and gas and coastal processes.

Findings and recommendations of the Environmental Impact Assessment Audit are expected in February 2008 and the EMA proposes to meet with stakeholders and source feedback on the results of the audit.

4.0 APPENDIX 1

BOARD OF DIRECTORS

As at December 31, 2007

Dr. John Agard	-	**Chairman**
Mr. David Abdulah	-	**Director**
Dr. Rohit Doon	-	**Director**
Ms. Molly Gaskin	-	**Director**
Dr. Carol James	-	**Director**
Mr. Ruben McSween	-	**Director**
Ms. Nafeesa Mohammed	-	**Director**
Mr. Raye Sandy	-	**Director**
Dr. Dave McIntosh	-	**Ex-Officio Member**
		Managing Director

BOARD COMMITTEES

HUMAN RESOURCES COMMITTEE

Mr. David Abdulah	-	**Chairman**
Dr. John Agard	-	**Member**
Mr. Ruben McSween	-	**Member**
Ms. Molly Gaskin	-	**Member**

PUBLIC AWARENESS AND EDUCATION COMMITTEE

Ms. Molly Gaskin	**-**	**Chairperson**
Mr. Ruben McSween	**-**	**Member**

TECHNICAL COMMITTEE

Dr. John Agard	**-**	**Chairman**
Dr. Rohit Doon	**-**	**Member**
Mr. Raye Sandy	**-**	**Member**
Dr. Carol James	**-**	**Member**
Ms. Nafeesa Mohammed	**-**	**Member**

TRUSTEES OF THE ENVIRONMENTAL FUND

Mr. Ruben McSween	**-**	**Chairman**
Ms. Molly Gaskin	**-**	**Trustee**
Mr. Raye Sandy	**-**	**Trustee**
Dr. Carol James	**-**	**Trustee**
Ms. Nafeesa Mohammed	**-**	**Trustee**

PART C: FINANCIAL STATEMENTS

Environmental Trust Fund

Audited Financial Report
for the year ended
September 30, 2007.

PKF

Accountants &
business advisors

INDEPENDENT AUDITORS' REPORT

The Trustees
Environmental Management Authority -
Environmental Trust Fund

We have audited the accompanying financial statements of Environmental Management Authority – Environmental Trust Fund, which comprise the balance sheet as at 30 September 2007, the statements of income, movement of funds and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory notes.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with International Financial Reporting Standards. This responsibility includes: designing, implementing and maintaining internal control, relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with International Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of Environmental Management Authority – Environmental Trust Fund as of 30 September 2007, and of its financial performance and cash flows for the year then ended in accordance with International Financial Reporting Standards.

Port of Spain
14 March 2008

PKF

ACCOUNTANTS AND BUSINESS ADVISORS

REPORT OF THE AUDITOR GENERAL OF THE REPUBLIC OF TRINIDAD AND TOBAGO ON THE FINANCIAL STATEMENTS OF THE ENVIRONMENTAL MANAGEMENT AUTHORITY - ENVIRONMENTAL TRUST FUND FOR THE YEAR ENDED 2007 SEPTEMBER 30

The accompanying Financial Statements of the Environmental Management Authority - Environmental Trust Fund for the year ended 2007 September 30 have been audited. The Statements as set out on pages 2 to 10 comprise a Balance Sheet as at 2007 September 30, a Statement of Income, a Statement of Movement of Funds and a Statement of Cash Flows for the year ended 2007 September 30 and Notes to the Financial Statements numbered 1 to 8.

2. The audit was conducted by a firm of Accountants appointed by the Board of Directors with the written consent of the Auditor General. Their Report dated 2008 March 14 refers.

SUBMISSION OF REPORT

3. This Report is being submitted to the Speaker of the House of Representatives, the President of the Senate and the Minister of Finance in accordance with the provisions of sections 116 and 119 of the Constitution of the Republic of Trinidad and Tobago.

REPUBLIC OF TRINIDAD AND TOBAGO
20080818
AUDITOR GENERAL

SHARMAN OTTLEY
AUDITOR GENERAL

2008 AUGUST 18

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

BALANCE SHEET

ASSETS

	Notes	30 September 2007	2006
Cash Resources:			
Cash in hand and at bank	3	$ 5,616,333	$ 5,791,127
Short-term investments	4	12,049,918	15,750,933
Total Cash Resources		17,666,251	21,542,060
Other Assets:			
Accounts receivable and prepayments	5	580,621	385,200
Fixed assets	6	24,557,969	17,207,215
Total Other Assets		25,138,590	17,592,415
Total Assets		**$42,804,841**	**$39,134,475**

LIABILITIES AND FUNDS

Liabilities:			
Accounts payable and accruals	7	$ 1,640,977	$ 2,397,165
Total Liabilities		1,640,977	2,397,165
Funds:			
GORTT Fund		36,505,155	32,427,846
UNDP Fund		(140,175)	(161,025)
IBRD Fund		4,178,917	4,227,745
Other Fund		619,967	242,744
Total Funds		41,163,864	36,737,310
Total Liabilities and Funds		**$42,804,841**	**$39,134,475**

Trustee

Trustee

(The accompanying notes form part of these financial statements)

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

STATEMENT OF INCOME

	For the year ended 30 September 2007	2006
Income:		
Government Fund	$ 29,295,000	$ 24,378,000
UNDP Fund	524,099	1,076,420
IBRD Fund	551,623	-
Other Fund income	377,223	193,450
Interest income	951,343	692,536
Activities income	2,945,506	4,582,450
Profit on disposal of fixed assets	71,826	-
Gain on foreign exchange	2,369	-
	34,718,989	30,922,856
Project expenses	(4,812,047)	(4,319,177)
Income after project expenditure	29,906,942	26,603,679
Expenditure:		
Advertising and promotions	1,290,799	812,650
Audit fees	65,000	52,350
Conference costs	51,902	10,350
Contract services	254,657	416,173
Depreciation	1,443,000	1,467,196
Directors' fees	229,200	229,200
Interest and bank charges	10,097	7,016
Insurance	329,489	292,876
Loss on disposal of fixed assets	-	187,673
Loss on foreign exchange	-	732
Motor vehicle expenses	267,214	324,694
Maintenance contracts	382,847	282,632
Office and general expenses	58,795	107,271
Permitting and compliance costs	2,619,799	1,466,342
Professional fees	109,592	19,234
Publication costs	45,000	229,200
Reference and research cost	155,152	120,189
Rent	576,632	422,500
Repairs and maintenance	285,310	201,933
Salaries and benefits	15,014,531	11,595,052
Security	434,189	419,962
Selection and recruitment costs	94,543	368,501
South office expenses	-	49,472
Supplies	577,835	420,050
Training	253,905	149,594
Travel	177,302	164,075
Utilities	753,598	688,698
	25,480,388	20,505,615
Net surplus for the year	$ 4,426,554	$ 6,098,064

(The accompanying notes form part of these financial statements)

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

STATEMENT OF MOVEMENT OF FUNDS

For the year ended 30 September 2007

	GORTT Fund	UNDP Fund	IBRD Fund	Other Fund	Total
Balance as at 1 October 2005	$ 25,320,818	$ 484,223	$4,550,873	$ 283,332	$30,639,246
Funds received	24,378,000	1,076,420	-	193,450	25,647,870
Interest income	692,536	-	-	-	692,536
Activities income	4,582,450	-	-	-	4,582,450
Expenditure	(22,545,958)	(1,721,668)	(323,128)	(234,038)	(24,824,792)
Balance as at 1 October 2006	32,427,846	(161,025)	4,227,745	242,744	36,737,310
Funds received	29,295,000	524,099	551,623	377,223	30,747,945
Interest income	944,265	-	7,078	-	951,343
Activities income	2,945,506	-	-	-	2,945,506
Profit on disposal of fixed asset	71,826	-	-	-	71,826
Gain on foreign exchange	2,369	-	-	-	2,369
Expenditure	(29,181,657)	(503,249)	(607,529)	-	(30,292,435)
Balance at 30 September 2007	**$ 36,505,155**	**$ (140,175)**	**$4,178,917**	**$ 619,967**	**$41,163,864**

(The accompanying notes form part of these financial statements)

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

STATEMENT OF CASH FLOWS

	For the year ended 30 September 2007	2006
Cash Flows from Operating Activities:		
Net surplus for the year	$ 4,426,554	$ 6,098,064
Adjustments:		
Depreciation	1,443,000	1,467,196
(Gain)/loss on disposal of fixed asset	(71,826)	187,673
	5,797,728	7,752,933
Net change in accounts receivable and prepayments	(195,421)	333,083
Net change in accounts payable and accruals	(756,188)	1,342,785
Cash provided by Operating Activities	4,846,119	9,428,801
Cash Flows from Investing Activities:		
Purchase of fixed assets	(8,892,126)	(1,103,840)
Proceeds from sale of fixed assets	170,198	17,165
Fixed assets disposal costs	-	(38,662)
Cash used in Investing Activities	(8,721,928)	(1,125,337)
Net change in cash and cash equivalents	(3,875,809)	8,303,464
Cash and cash equivalents, beginning of year	21,542,060	13,238,596
Cash and cash equivalents, end of year	**$17,666,251**	**$21,542,060**
Represented by:		
Cash in hand and at bank	$ 5,616,333	$ 5,791,127
Short-term investments	12,049,918	15,750,933
	$17,666,251	**$21,542,060**

(The accompanying notes form part of these financial statements)

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

30 SEPTEMBER 2007

1. **Registration and Activities:**

The Environmental Management Authority is a Statutory Authority established when Parliament assented to the Environmental Management Act on 7 March 1995. The Authority was established to develop and implement institutional arrangements for the regulation and management of the environment in the Republic of Trinidad and Tobago.

The Environmental Trust Fund was established by the Act to fund the operations of the Authority and is administered by five members of the Board of Directors, designated by the President to act as Trustees.

The Environmental Management Act 1995 was repealed in March 2000 and replaced by the Environmental Management Act 2000. The new Act changed the financial year end of the Authority to 30 September.

2. **Accounting Policies:**

The accounting policies of the Authority's Trust Fund are based on generally accepted accounting principles. The most significant of these are summarised below:

(a) **Basis of Accounting -**

These financial statements have been prepared in accordance with International Financial Reporting Standards on the historical cost basis and no account has been taken of the effects of inflation.

(b) **Reporting Currency -**

These financial statements are reported in Trinidad and Tobago dollars.

(c) **Income Recognition -**

Interest on loans is recognised on a cash basis consistent with previous years. Except as stated above, the accruals basis of accounting has been used for the recording of income and expenses.

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

30 SEPTEMBER 2007

2. Accounting Policies (Cont'd):

(d) **Depreciation -**

Depreciation is provided for on a reducing balance basis at annual rates designed to write-off the respective costs of fixed assets over their estimated useful economic lives as follows:-

Building	-	2% - 20%
Furniture and fittings	-	10%
Office equipment	-	20%
Motor vehicles	-	25%
Computer equipment	-	25%
Library/Information	-	10%

(e) **Foreign Currency -**

Monetary assets and liabilities denominated in foreign currencies are expressed in Trinidad and Tobago dollars at rates of exchange ruling at the balance sheet date. Non-monetary assets and liabilities are converted at the rate of exchange at the date of the transaction. Income and expenses are converted at the average rate of exchange.

(f) **Taxation -**

The Authority is exempt from taxation under the Environmental Management Act of 2000, Part VII Section 76.

(g) **Use of Estimates -**

The preparation of financial statements in conformity with International Financial Reporting Standards requires management to make estimates and assumptions that affect the reported amount of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of the income and expenses during the reporting period. Actual results could differ from those estimates.

(h) **Comparative Information -**

Where necessary, comparative amounts have been adjusted to conform with changes in presentation in the current year.

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

30 SEPTEMBER 2007

3. **Cash in Hand and at Bank:**

	30 September 2007	2006
Petty cash	$ 6,816	$ 3,982
Republic Bank Limited -		
Operating account	3,826,152	4,046,809
Nariva Carbon Assessment Grant	278,309	-
First Citizens Bank Limited -		
Permit income account	266,111	946,911
RBTT Bank Limited -		
Institutional strengthening	127,957	118,267
Other projects	196,113	104,725
Biodiversity	41,934	41,934
UNFCCC	319,350	152,665
Biosafety	344,401	325,819
Scotiabank Trinidad and Tobago Limited -		
Terminal Phaseout Management Plan	156,492	19,078
Fleet Card	52,698	30,937
	$ 5,616,333	$ 5,791,127

4. **Short-term Investments:**

	30 September 2007	2006
Republic Bank Limited Pool Bond	$ 4,070,946	$ 4,626,182
First Citizens Bank Limited – Abercrombie Fund	-	1,241,349
Trinidad and Tobago Unit Trust Corporation	3,641,502	4,838,683
RBTT Bank Limited	4,337,470	5,044,719
	$ 12,049,918	$ 15,750,933

5. **Accounts Receivable and Prepayments:**

	30 September 2007	2006
Accounts receivable	$ 6,000	$ 28,000
VAT receivable	438,743	314,011
Other receivables	102,019	2,250
Prepayments	33,859	40,939
	$ 580,621	$ 385,200

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

30 SEPTEMBER 2007

6. Fixed Assets:

Cost	Land	Building	Furniture and fittings	Office equipment	Motor vehicles	Computer equipment	Library/ information	Total
Balance as at 1 October 2006	$ 3,229,868	$ 11,336,082	$ 2,252,718	$ 3,512,586	$ 2,345,422	$ 3,365,806	$ 332,331	$ 26,374,813
Additions	7,500,000	-	298,912	139,066	599,737	354,411	-	8,892,126
Disposals	-	-	-	(4,500)	(497,105)	-	-	(501,605)
Balance as at 30 September 2007	10,729,868	11,336,082	2,551,630	3,647,152	2,448,054	3,720,217	332,331	34,765,334
Accumulated Depreciation								
Balance as at 1 October 2006	-	2,455,551	939,338	1,834,212	1,416,434	2,330,639	191,424	9,167,598
Charge for the year	-	317,814	144,051	350,903	304,112	312,030	14,090	1,443,000
Disposals	-	-	-	(1,904)	(401,329)	-	-	(403,233)
Balance as at 30 September 2007	-	2,773,365	1,083,389	2,183,211	1,319,217	2,642,669	205,514	10,207,365
Net Book Value								
Balance as at 30 September 2007	$10,729,868	$ 8,562,717	$ 1,468,241	$ 1,463,941	$ 1,128,837	$ 1,077,548	$ 126,817	$ 24,557,969
Balance as at 30 September 2006	$ 3,229,868	$ 8,880,531	$ 1,313,380	$ 1,678,374	$ 928,988	$ 1,035,167	$ 140,907	$ 17,207,215

ENVIRONMENTAL MANAGEMENT AUTHORITY
ENVIRONMENTAL TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

30 SEPTEMBER 2007

7. **Accounts Payable and Accruals:**

	30 September 2007	2006
Accounts payable	$ 480,303	$ 1,008,139
Other payables	30,447	33,834
Accruals	1,130,227	1,355,192
	$ 1,640,977	$ 2,397,165

8. **Funding:**

Funding was provided to the Environmental Management Authority Environmental Trust Fund as follows:

(i) Proceeds of a loan of US$6.25 million from the IBRD to the Government of the Republic of Trinidad and Tobago (GORTT). The loan facility closed on 31 December 2000. During the financial year ended 30 September 2007, the EMA received grant funds from the IBRD to facilitate the Nariva Reforestation Initiative Project.

(ii) Ongoing funding from the GORTT to cover recurrent and development programme expenditure.

(iii) Grant funds are provided by the United Nations Development and Environment Programmes (UNDP and UNEP) to fund specific activities that are set out in the relevant multilateral agreements. The main projects administered by the Environmental Management Authority Environment Trust Fund during the financial year ended 30 September 2007 are the Second National Communication to the Convention on Climate Change; Phase IV of the Institutional Strengthening Programme for the Phase-out of Ozone Depleting Substances; and Phase II of the Terminal Management Plan for the Phase-out of CFC's.

Funds received during the year ended 30 September 2007 are as follows:

		30 September 2007	2006
External Funding			
UNDP	TT$	$ 524,099	$ 1,076,420
IBRD	TT$	551,623	-
Other	TT$	377,223	193,450
Core Funding			
GORTT	TT$	29,295,000	24,378,000
Activities Income	TT$	2,945,506	4,582,450

PART D: FINANCIAL ASSISTANCE OR OTHER SUPPORT

There are no qualifying activities under Section 14 (1d) of the Environmental Management Act, 2000, for the year 2007.

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