DENR-EMB

INTRODUCTION AND SALIENT FEATURES OF THE WATER QUALITY MONITORING AND ASSESSMENT PROGRAM

October 6-7, 2021

Water Quality Monitoring and Assessment Program

- Define and clear the Objectives
- Define the Strategy and Process
- Framework Plan
- Identify pollution sources
- Key elements of water quality assessments program
- Conclusions and Recommendations

- **Define the Objectives**
  - No assessment program should be started without scrutinizing critically the real need for water quality information (i.e. the “need to know” as opposed to “it would be nice to know”).

Two different types of monitoring program depending on objectives:

- ***Single-objective monitoring*** which may be set up to address one problem area only. This involves a simple set of variables, such as: pH, alkalinity and some cations for acid rain; nutrients and chlorophyll pigments for eutrophication
- ***Multi-objective monitoring*** which may cover various water uses and provide data for more than one assessment program, such as drinking water supply, industrial manufacturing, fisheries or aquatic life, thereby involving a large set of variables.

- **Key elements of water quality assessments program**

There are certain standard elements which are common to all water quality assessment program

- **Objectives**

These should take into account the hydrological factors, the water uses, the economic development, the legislative policies etc. Necessary decisions involve whether the emphasis should be put on concentrations or loads, or spatial or time distributions, and the most appropriate monitoring media.

- **Preliminary**

These are short-term, limited activities to determine the water quality surveys variability, the type of monitoring media and pollutants to be considered, and the technical and financial feasibility of a complete monitoring program.

- **Monitoring design**

This includes the selection of types of pollutants, station location, sampling frequency, sampling apparatus, etc.

- **Field monitoring operations**

These include *in situ* measurements, sampling of appropriate media (water, biota, particulate matter), sample pretreatment and conservation, identification and shipment.

- **Hydrological monitoring**

This includes water discharge measurements, water levels, thermal profiles, etc., and should always be related to the water quality assessment activities.

- **Laboratory activities**

These include concentration measurements, biological determinations, etc.

- **Data quality control**

This must be undertaken by using analytical quality assurance within each laboratory, and amongst all laboratories participating in the same program, and by checking field operations and hydrological data.

- **Data storage**

This is now widely computerized and involves the use of databases, treatment and statistical analysis, trend determinations, multi-factorial correlation, etc., reporting and presentation and dissemination of results in appropriate forms (graphs, tabulated data, etc.).

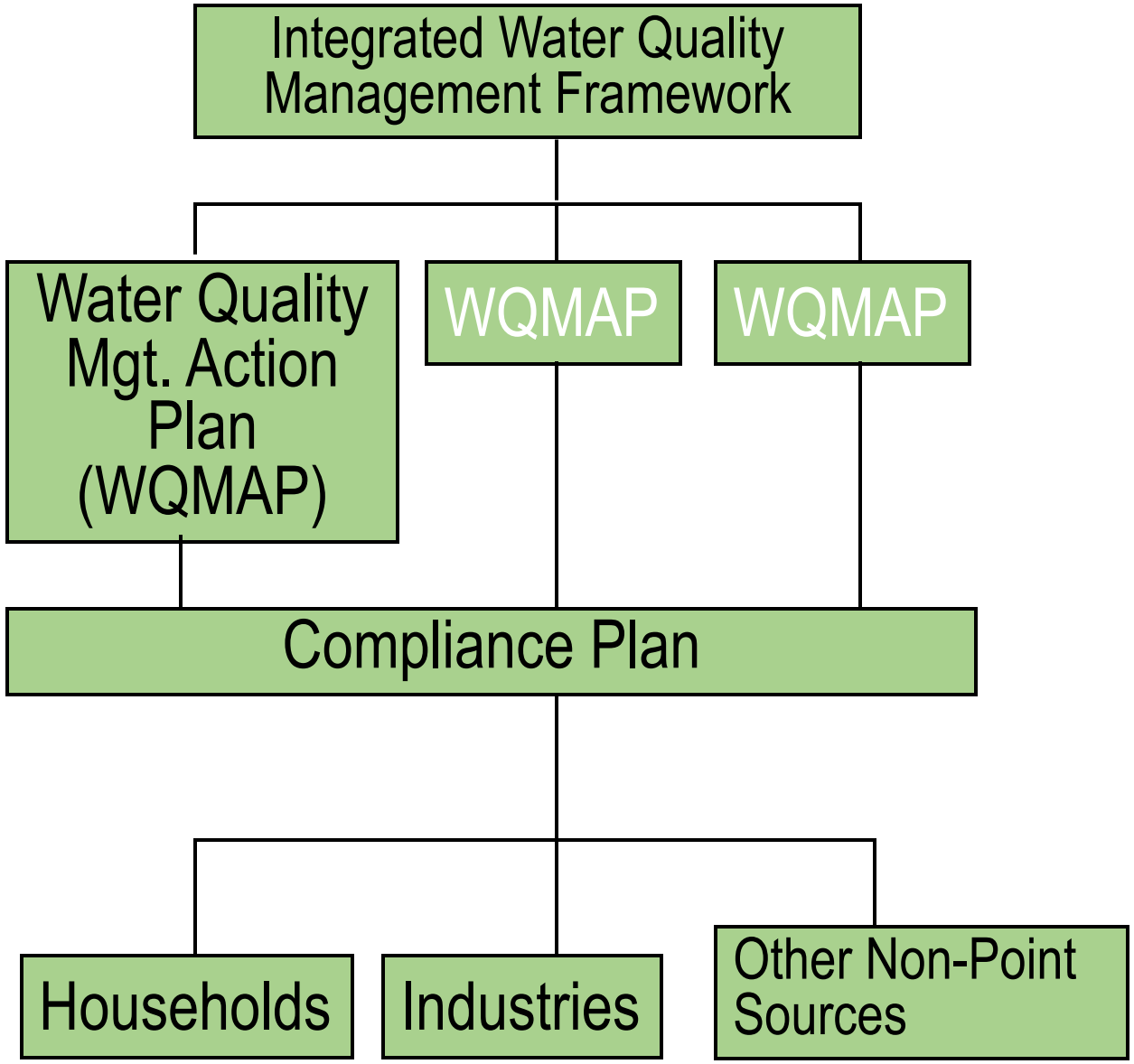
- **Data interpretation**

This involves comparison of water quality data between stations (water quality descriptors, fluxes), analysis of water quality trends, development of cause-effect relationships between water quality data and environmental data (geology, hydrology, land use, pollutant sources inventory), and judgement of the adequacy of water quality for various uses etc.

- **Authorities (Government Agency)**

These decisions should be taken at various levels from government management authorities as well as by other recommendations environmental authorities. An important decision is the re-design of assessment operations, to improve the monitoring program and to make it more cost-effective.

CONCEPTUAL FRAMEWORK



MAJOR POLLUTANT AND SOURCES OF POLLUTION

	POINT SOURCES		NON-POINT SOURCES	
Pollutant Category	Domestic Sewage	Commercial /Industrial waste	Agricultural Run-off	Urban Run-off
Oxygen Demanding Material	*	*	*	*
Nutrients	*	*	*	*
Pathogens	*	*	*	*
Suspended Solids/Sediments	*	*	*	*
Salts		*	*	*
Toxic Metals		*		*
Toxic Organic Chemicals		*	*	
Heat		*		

Reasons for obtaining inadequate information from assessment program

- The objectives of the assessment were not properly defined.
- The monitoring system was installed with insufficient knowledge of the water body.
- There was inadequate planning of sample collection, handling, storage and analysis.
- Data were poorly archived.

A further reason could be added:

• Data were improperly interpreted and reported.

The ten basic rules for a successful assessment progam

1. The objectives must be defined first and the program adapted to them and not *vice versa* (as was often the case for multi-purpose monitoring in the past). Adequate financial support must then be obtained.
2. The type and nature of the water body must be fully understood (most frequently through preliminary surveys), particularly the spatial and temporal variability within the whole water body.
3. The appropriate parameters must be chosen.

4.The variables, type of samples, sampling frequency and station location must be chosen carefully with respect to the objectives.

5. The field, analytical equipment and laboratory facilities must be selected in relation to the objectives and not *vice versa*.

6. A complete, and operational, data treatment scheme must be established.

7. The monitoring of the quality of the aquatic environment must be coupled with the appropriate hydrological monitoring.

8. The analytical quality of data must be regularly checked through internal and external control.
9. The data should be given to decision makers, not merely as a list of variables and their concentrations, but interpreted and assessed by experts with relevant recommendations for management action.
10. The program must be evaluated periodically, especially if the general situation or any particular influence on the environment is changed, either naturally or by measures taken in the catchment area.

TO INCLUDE IN WATER BODIES ASSESSMENT PLAN:

- **Pollution Loading Assessment of water bodies**

- **Assessment on assimilative capacity of water body**

CONCLUSIONS

In the design of a water quality monitoring systems, many factors have to be taken into consideration.

- Great caution has to be exercised in the selection of suitable monitoring sites, collection of representative samples and
- Determination of sampling technique and analytical methods to ensure that the data collected from different laboratories are meaningful and comparable.
- In addition, the availability and constraints of human and financial resources in a country should be taken into consideration in the design of water quality monitoring programmes.

RECOMMENDATIONS

- Water quality assessment should always be seen in the wider context of the management of water resources, encompassing both the quality and quantity aspects.
- The usefulness of the information obtained from monitoring is severely limited unless an administrative and legal framework (together with an institutional and financial commitment to appropriate follow-up action) exists at national and regional levels.

thank you

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MANILA BAY REHABILITATION

Implementation of the OPMBCS "Operational Plan for the Manila Bay Coastal Strategy"

Supreme Court Decision G.R. Nos. 171947-48.

Supreme Court Decision General Registry Nos. 171947-48.

MANILA BAY REHABILITATION

EMB-DENR

LIQUID WASTE CLUSTER MANAGEMENT

Implementation of the OPMBCS "Operational Plan for the Manila Bay Coastal Strategy"

Salient Features on assessment of Water Body

1. **Manila Bay Rehabilitation as per Supreme Court Decision G.R. Nos. 171947-48.**
   (Water Bodies Classification "SB" level)
2. **MANDAMUS agencies quarterly updates on the implementation of Operational Plan for the Manila Bay Coastal Strategies (OPMBCS)**
3. **Manila Bay –Liquid Waste Management Cluster**
4. **River Water Quality Monitoring**
5. **Assessment of Pollution Loading**

THE MANILA BAY AREA

The Manila Bay Area (MBA)

- Coastline: 190 kilometers
- Surface Area: 1,870 km^2 or 187,000 has.
- Drainage Area: 17, 540 km^2 or 1.7M has.
- Comprising 3 regions - the National Capital Region, Central Luzon and CALABARZON.
- Its entire watershed is drained by major river systems
- 187 LGUs

Operational Plan for the Manila Bay Coastal Strategy

2017-2022

Manila Bay Coordinating Office and Mandamus Lead Agencies

GOAL

Manila Bay cleaned-up, rehabilitated, and preserved, and its waters restored and maintained at SB level (mandamus)

Supreme Court Mandamus Order to DENR et al.

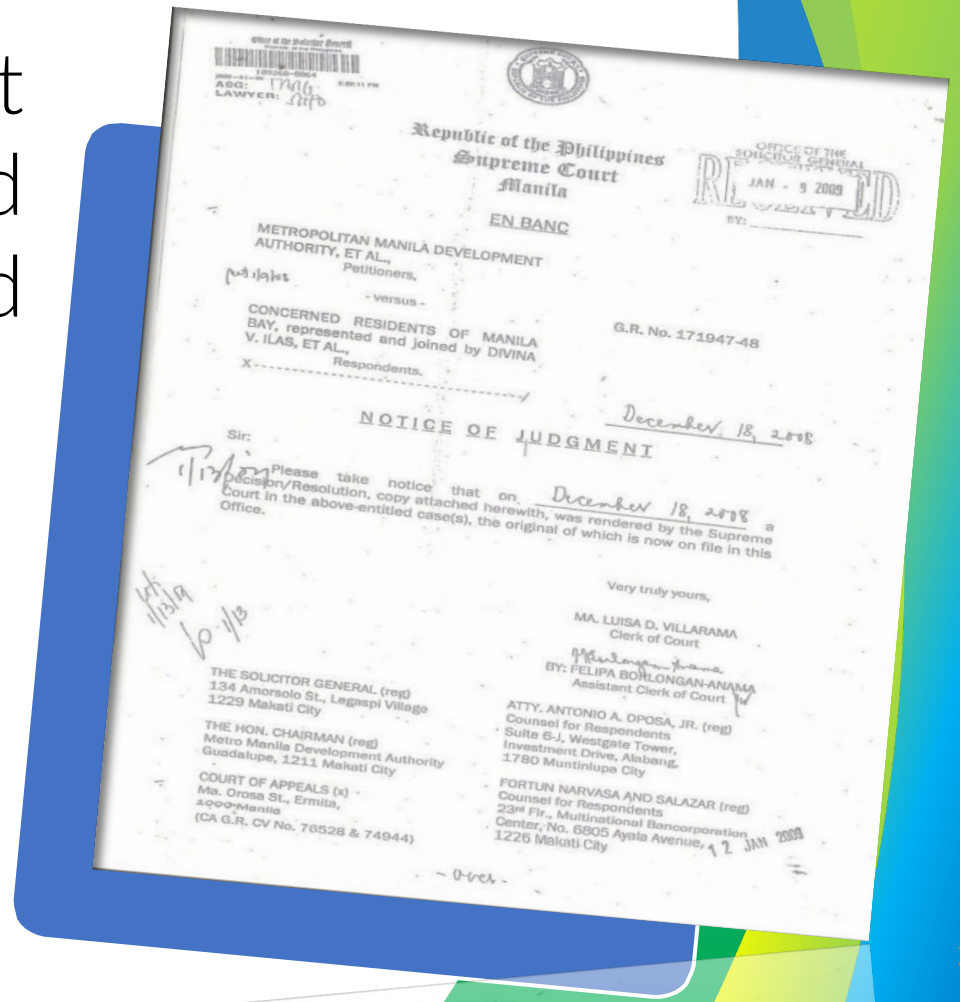
The DENR is directed to fully implement its **Operational Plan for the Manila Bay Coastal Strategy** (OPMBCS) for the rehabilitation, restoration, and conservation of the Manila Bay at the earliest possible time.

It is ordered to with concerned government departments and call regular coordination meetings agencies to ensure the successful implementation of the aforesaid plan of action in accordance with its indicated completion schedules.

Supreme Court Order Mandamus on Manila Bay

Directed mandamus government agencies to clean up, rehabilitate and preserve Manila Bay and restore and maintain its water to SB level.

Class SB sea waters per Water Classification Tables under DENR Administrative Order No. 2016–08
fit for swimming, skin-diving, and other forms of contact recreation.



Republic of the Philippines
Supreme Court
Manila

EN BANC

METROPOLITAN MANILA DEVELOPMENT AUTHORITY, ET AL.,
Petitioners,
- versus -
CONCERNED RESIDENTS OF MANILA BAY, represented and joined by DIVINA V. ILAS, ET AL.,
Respondents.
G.R. No. 171947-48

NOTICE OF JUDGMENT

Sir:
Please take notice that on December 18, 2008 a Decision/Resolution, copy attached herewith, was rendered by the Supreme Court in the above-entitled case(s), the original of which is now on file in this Office.

Very truly yours,
MA. LUISA D. VILLARAMA
Clerk of Court
BY: FELIPA BONLONGAN-ANAMA
Assistant Clerk of Court

THE SOLICITOR GENERAL (reg)
134 Amorsolo St., Legaspi Village
1229 Makati City

THE HON. CHAIRMAN (reg)
Metro Manila Development Authority
Guadalupe, 1211 Makati City

COURT OF APPEALS (x)
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1000-Manila
(CA G.R. CV No. 76528 & 74944)

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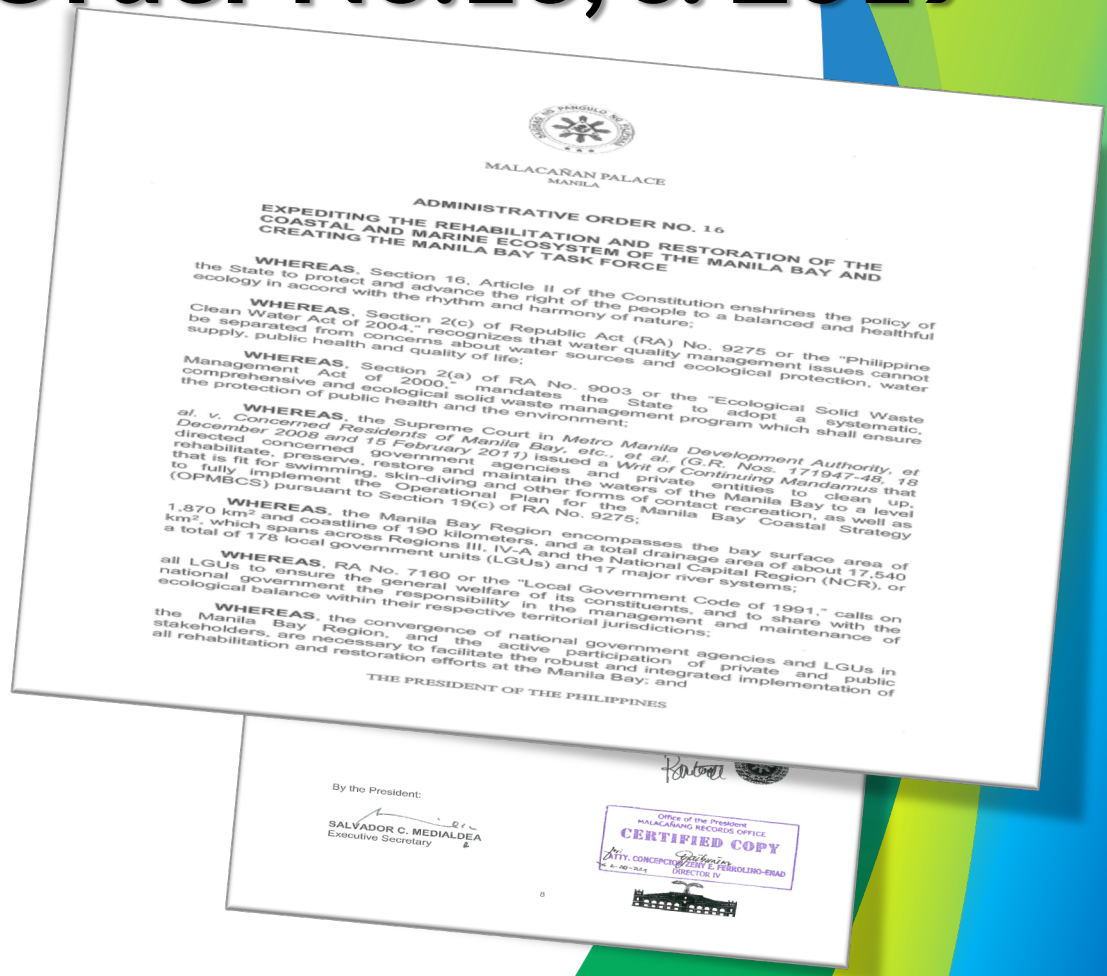
1226 Makati City

Organization of the Manila Bay Task Force Presidential Administrative Order No.16, s. 2019

- Expediting the Rehabilitation and Restoration of the Coastal and Marine Ecosystem of the Manila Bay and Creating the Manila Bay Task Force
- Signed on February 19, 2019



MALACAÑAN PALACE
MANILA

ADMINISTRATIVE ORDER NO. 16

EXPEDITING THE REHABILITATION AND RESTORATION OF THE COASTAL AND MARINE ECOSYSTEM OF THE MANILA BAY AND CREATING THE MANILA BAY TASK FORCE

WHEREAS, Section 16, Article II of the Constitution enshrines the policy of the State to protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature;

WHEREAS, Section 2(c) of Republic Act (RA) No. 9275 or the "Philippine Clean Water Act of 2004," recognizes that water quality management issues cannot be separated from concerns about water sources and ecological protection, water supply, public health and quality of life;

WHEREAS, Section 2(a) of RA No. 9003 or the "Ecological Solid Waste Management Act of 2000," mandates the State to adopt a systematic, comprehensive and ecological solid waste management program which shall ensure the protection of public health and the environment;

WHEREAS, the Supreme Court in *Metro Manila Development Authority, et al. v. Concerned Residents of Manila Bay, etc., et al.* (G.R. Nos. 171947-48, 18 December 2008 and 15 February 2011) issued a *Writ of Continuing Mandamus* that directed concerned government agencies and private entities to clean up, rehabilitate, preserve, restore and maintain the waters of the Manila Bay to a level that is fit for swimming, skin-diving and other forms of contact recreation, as well as to fully implement the Operational Plan for the Manila Bay Coastal Strategy (OPMBCS) pursuant to Section 19(c) of RA No. 9275;

WHEREAS, the Manila Bay Region encompasses the bay surface area of 1,870 km^2 and coastline of 190 kilometers, and a total drainage area of about 17,540 km^2, which spans across Regions III, IV-A and the National Capital Region (NCR), or a total of 178 local government units (LGUs) and 17 major river systems;

WHEREAS, RA No. 7160 or the "Local Government Code of 1991," calls on all LGUs to ensure the general welfare of its constituents, and to share with the national government the responsibility in the management and maintenance of ecological balance within their respective territorial jurisdictions;

WHEREAS, the convergence of national government agencies and LGUs in the Manila Bay Region, and the active participation of private and public stakeholders, are necessary to facilitate the robust and integrated implementation of all rehabilitation and restoration efforts at the Manila Bay; and

THE PRESIDENT OF THE PHILIPPINES

By the President:

SALVADOR C. MEDIALDEA
Executive Secretary

Office of the President
MALACAÑANG RECORDS OFFICE
CERTIFIED COPY
ATTY. CONCEPCION JENNY E. FERROLINO-ERIAD
DIRECTOR IV

Manila Bay TASK FORCE – DENR Special Order No.17 s.2020

Republic of the Philippines
Department of Environment and Natural Resources
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Trunkline (632) 929-6626; 929-6628; 929-6635; 929-4028; 929-3618
Voice-Over-Internet-Protocol (VOIP) Trunkline (632) 988-3367
Website: http://www.denr.gov.ph / E-mail: Web@denrgov.ph

SPECIAL ORDER
No. 2021 - 17

JAN 26 2021

SUBJECT: CREATION OF THE MANILA BAY ANTI – POLLUTION TASK FORCE

In the interest of service and in order to expedite the rehabilitation and restoration of the coastal and marine ecosystem of the Manila Bay and to ensure compliance with the mandate given by the Office of the President to the Department of Environment and Natural Resources (DENR) pursuant to Administrative Order No. 16, the Manila Bay Anti-Pollution Task Force (MBAPTF) is hereby created.

The MBAPTF shall be headed by the Undersecretary for Solid Waste Management and Local Government Units Concerns (SWMLGUC) and shall be supported by the following offices:

- Manila Bay Coordinating Office,
- River Basin Control Office,
- Pasig River Coordinating and Management Office,
- National Water Resources Board,
- Laguna Lake Development Authority, and
- Environmental Management Bureau in Regions III, IV-A and the National Capital Region (NCR)

The Task Force shall have the following duties and responsibilities:

- Ensure compliance of all government facilities, subdivisions, condominiums, commercial centers, hotels, sports and recreational facilities, hospitals, market places, public buildings, industrial complex and other similar establishments within the entire Manila Bay Region relative to their connection on existing sewerage systems or the construction of their individual sewerage plant, whenever is applicable, as well as recommend for the issuance of appropriate orders, imposition of fines, penalties and other administrative sanctions to compel compliance thereof;
- Spearhead the undertaking of remedial measures using engineering and technological interventions to improve the water quality of the Manila Bay, such as sustained and targeted reduction in the coliform level of all major river systems and tributaries within the Manila Bay Region;
- Strictly monitor the enforcement of Sections 16 and 19 of Republic Act 9275 or the Clean Water Act, on the conduct of containment, removal and clean-up operations, and the exercise of the supervision and control on all aspects of water quality management in the Manila Bay Region through standard setting, regular monitoring and determination of strategic areas;
- Inspect all sanitary landfills located in the NCR, Region III and Region IV-A which affect the Manila Bay, ensure their compliance with Sections 41 and 42 of Republic Act 9003 or the Solid Waste Management Act of 2000, and impose appropriate sanctions in case of violation; and
- Monitor compliance of all environmental laws, rules and regulations in which the MBAPTF shall also have the authority to issue notices of violation or closure, cease and desist orders, and other appropriate sanctions to violators, including the filing of cases against violators.

The MBAPTF head shall have the authority to call upon the assistance of concerned DENR offices including bureaus and attached agencies for the effective implementation of this Order.

All expenses to be incurred shall be charged against DENR funds, subject to the usual accounting and auditing rules and regulations.

This Order takes effect immediately and supersedes all issuances or orders inconsistent herewith.

ROY A. CIMATU
Secretary

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
SENR059492

Manila Bayanihan Para sa KALINISAN

MANILA BAY REHABILITATION PROGRAM

DENR –MBCO Created FOUR (4) CLUSTER GROUP

- LIQUID WASTE MANAGEMENT CLUSTER
  (Chair by EMB-DENR)
- SOLID WASTE MANAGEMENT CLUSTER
  (Chair by DILG/MMDA)
- INFORMAL SETTLER MANAGEMENT CLUSTER
  (Chair by DILG/MMDA/DPWH)
- HABITAT MANAGEMENT CLUSTER
  (Chair by BMB-DENR)

VISION

- **MANILA BAY-reflective of God's Glory –is a clean, safe ,wholesome and productive ecosystem, a center of socio economic development and natural heritage nurtured by genuine Filipino values with regard to better quality of life for the present and future generations**

VISION

We, the Manila Bay stockholders, are collaborative partners in:

Rehabilitating, protecting and maintaining a healthy ecosystem in the Manila Bay;

Developing both terrestrial and water resources on a sustainable basis for the utmost benefit of present and future generations;

Preserving social, cultural, historical and ecological values;

Formulating and implementing policies, plans and programs, laws and regulations with priority consideration given to those who depend on the resources and services provided by Manila Bay for their sustenance.

STRATEGIES

- **PROTECT - human welfare and the ecological, historical, cultural and economic features of Manila Bay for the benefit and security of present and future generations**
- **MITIGATE - environmental risk that occur as a consequence of human activities in Manila Bay coastal areas and surrounding watersheds**
- **DEVELOP - areas and opportunities in Manila Bay in consonance with environmental goals, policies and plans, thereby striking a balance between economic development and environmental management**

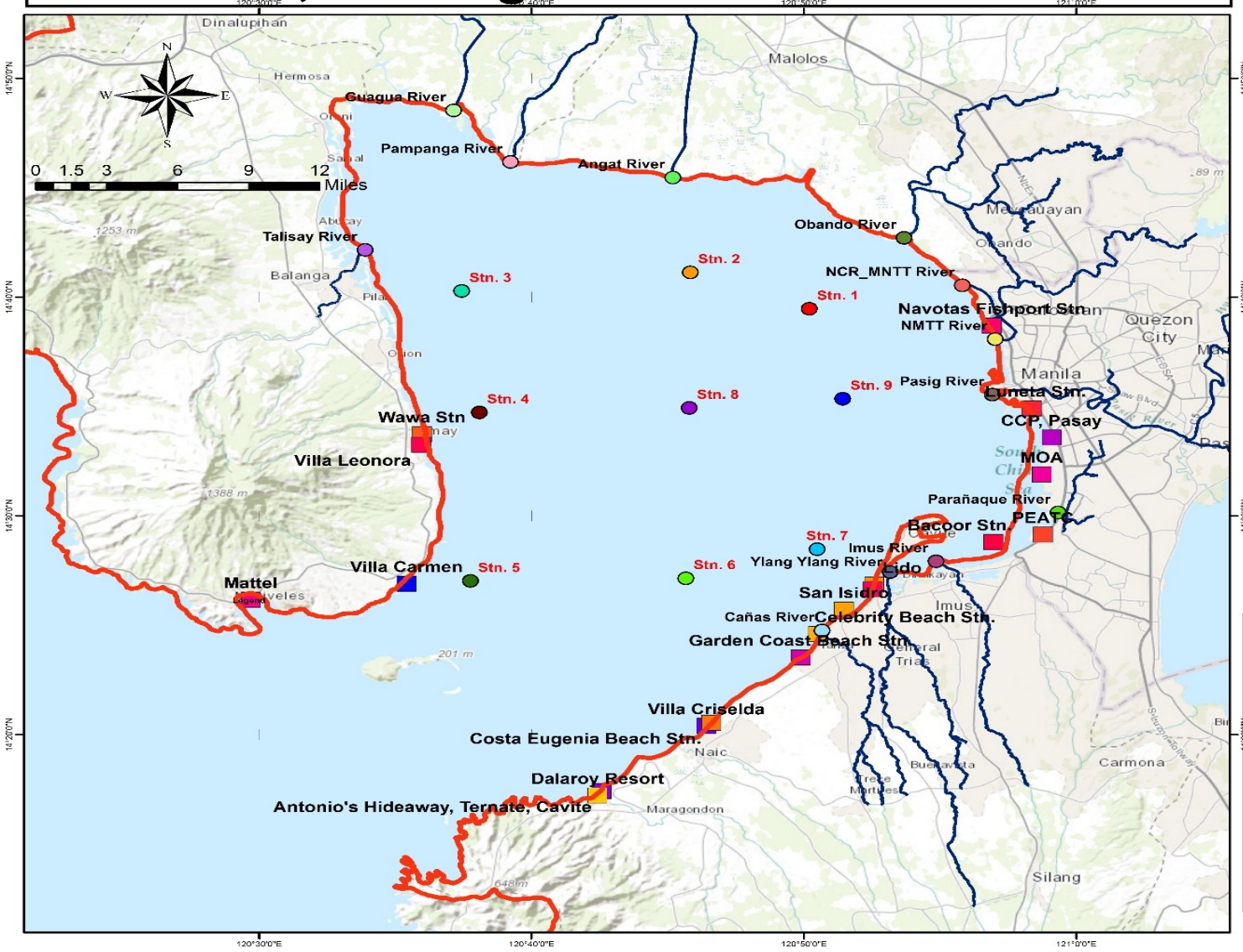
STRATEGIES

- **COMMUNICATE - with stakeholders regarding their rights and responsibilities, and issues concerning the coastal and marine environment, thereby ensuring their involvement and active participation in the development and implementation of environmental management programs**
- **DIRECT- the formulation and implementation of policies and institutional mechanisms to achieve sustainable development in the Manila Bay through interagency and inter-sectoral partnerships at the national and local level**

WE WILL UNDERTAKE THESE ACTIONS WITH A GENUINE COMMITMENT, CONCERTED EFFORT AND STRONG POLITICAL WILL

MANILA BAY Water Quality Monitoring Stations (EMB NCR, RIII and RIV-A)

River, Bathing Beaches and Offshore



Legend

- MB BOUNDARY

Offshore Station Name

- Stn. 1
- Stn. 2
- Stn. 3
- Stn. 4
- Stn. 5
- Stn. 6
- Stn. 7
- Stn. 8
- Stn. 9

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

River Mouth River_Name

- Angat River
- Cañas River
- Guagua River
- Imus River
- NCR_MNTT River
- NMTT River
- Obando River
- Pampanga River
- Parañaque River
- Pasig River
- Talisay River
- Ylang Ylang River

Bathing Beaches Name

- Antonio's Hideaway, Ternate, Cavite
- Bacoor Stn.
- CCP, Pasay
- Celebrity Beach Stn.
- Costa Eugenia Beach Stn.
- Dalaroy Resort
- Garden Coast Beach Stn.
- Lido
- Luneta Stn.
- MOA
- Mattel
- Navotas Fishport Stn
- PEATC
- San Isidro
- Villa Carmen
- Villa Criselda
- Villa Leonora
- Villamar Beach Stn.
- Wawa Stn

BATHING BEACHES

adverse effect on increase of fecal coliform

(GEOMEAN)
MPN/100mL

Class SB
(MPN/100mL)

Absence of sewerage treatment plants

Discharges from Rivers

Discharges from Informal Settlers

GEOMEAN
MPN/100mL

MPN = Most Probable Numbers

LIQUID WASTE MANAGEMENT CLUSTER

- Quarterly workshop/seminar/meeting is regularly conducted
- Discussion of accomplishments reports in each MANDAMUS AGENCIES
- Resolve issues and concerns with partner agencies

ASSESSMENT OF POLLUTION LOADING

POLLUTION LOADING from:

- COMERCIAL/INDUSTRIAL WASTES
- DOMESTIC WASTES
- HAZARDOOUS/HOSPITAL WASTES
- AGRICULTURAL WASTES
- RUN OFF WASTEWATER
- INFORMAL SETTLERS FAMILIES ALONG RIVER/CREEKS /COASTAL AREAS

thank you

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