OVERVIEW

The Environmental Management Bureau (EMB) is a Line Bureau of the DENR mandated to implement and enforce six (6) major environmental laws:

1. PD 1586 - Environmental Impact Statement System 1978
2. RA 6969 - Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990
3. RA 8749 - Clean Air Act of 1999
4. RA 9003 - Ecological Solid Wastes Management Act of 2000
5. RA 9275 - Clean Water Act of 2004
6. RA 9512 - National Environmental Awareness and Education Act of 2008

Pursuant to Executive Order No. 192, EMB is also mandated to provide research and laboratory services, and secretariat services to the Pollution Adjudication Board and the National Solid Waste Management Commission.

The EMB is committed to pursue programs and projects that are in line with the ENR thrusts under the Philippine Development Plan (PDP) 2011-2016, which is to improve environmental quality for a cleaner and healthier environment. In order to provide the communities with a healthier environment, the Bureau will continue to pursue a strong agenda of environmental reform, manage wastes and contribute to the enhancement of the development process thru formulation of new laws and policy frameworks.

There have been progressive improvements in air quality which could be attributed to different interventions like full implementation of Vehicle Emission Limits for EURO 4/IV and In-Use Vehicle Emission Standards (DAO 2015-04) effective 01 January 2016, garage testing, strengthened monitoring of private emission testing centers and stricter monitoring of stationary sources of pollution including the major industries.

The Bureau collects real-time air quality data from ninety eight (98) air quality monitoring stations that is capable of measuring Sulphur Dioxide, Nitrogen Dioxide, Ozone, Carbon Monoxide, Benzene, Toluene and Xylene as well as meteorological data in its bid to strengthen the monitoring of air pollutants in Metro Manila and other urban centers nationwide.
The Airnet Manila is a system to establish an air quality information mechanism for Metro Manila and other urban areas. The theme “Malinis na Hangin, Karapatan Ko” “Hangin Ko, Alaga Ko” is being used for the information campaign. It aims to operationalize and digitally collate real time publication and tri-media quick response action to institute effective data collection and IEC activities and tri field action / operation.

The implementation of “Adopt-an-Estero Program” which covers esteros/creeks, waterways and major rivers nationwide was expanded in CY 2016 with four (4) additional new esteros/waterbodies adopted for each region.

In order to address water quality issues and problems in the area and later result to improvement or better water quality of the waterbody, the Water Quality Management Area (WQMA) Action Plan was prepared and implemented on various waterbodies nationwide. Additional ten (10) WQMA s established which aims to protect thru stakeholders collaboration, the water body and its tributaries by keeping their water quality within the Water Quality Guidelines or Criteria conforming to the water body’s classification (e.g. Class C or Class SC) or even improve the quality to higher classification (e.g. from C to B or SC to SB).

More partnerships were encouraged with various industries and other national and local government agencies, IEC and clean-up activities were intensified and private entities serving as environment partners exhibiting excellent environmental performance were recognized. The program also increased the awareness of the communities along esteros/waterbodies. With clean water ways, there is less water pollution, less flooding, less diseases and cleaner surroundings.

In response to the different issues of the LGUs for low compliance to RA 9003 (Ecological Solid Waste Management Act of 2000), technical assistance were provided for the LGUs in the formulation of 10-Year Solid Waste Management (SWM) Plan (818 plans approved in CY 2016), monitoring and operationalization of Materials Recovery Facility (9,883 MRF servicing 13,155 barangays nationwide), operationalization of Sanitary Landfill (118 SLFs nationwide) and other environment friendly disposal. The operation of illegal dumpsites has also decreased by 7.6% from 553 dumpsites in CY 2015 to 511 dumpsites in CY 2016.

The Bureau also organized a massive clean-up activities nationwide, dubbed as “Bayan Ko, Linis Ko” on 17 September 2016 for the National Clean-up Day, in collaboration with Local Government Units (LGUs), Non-Government Organizations (NGOs), Academe and the Private Sector. The event aims to boost the spirit of volunteerism and social harmony in the country by collectively engaging various groups and individuals to organize clean up activities that will help address the country’s solid waste problem. A total of 771 LGUs participated with 11,819 clean-up groups registered, 159,638 volunteers and 1,267 sites (barangays, schools, creeks, various waterways, coastal and other areas) cleaned nationwide.
To facilitate and be more effective in the implementation of environmental laws, various information and education campaigns were pursued such as the use of print media, broadcast and exhibits. Orientation seminars/capacity trainings were also conducted for LGUs and other stakeholders for the effective implementation of the six (6) environmental laws.

Cognizant of the global issue of climate change and the adverse impacts it has on our country’s environment and natural resources, the EMB undertook significant initiatives to address this phenomenon. The launching of the very first solar rooftop panels placed at the rooftop of the EMB’s Environmental Research and Laboratory Services Division building is one of the highlights of the Bureau’s innovations to promote clean energy. A 100-kilowatt (kW) “Solar Project” in partnership with state-owned Philippine National Oil Company (PNOC) will allow the DENR to generate approximately 140,000 kWh of electricity per year which in turn, can generate savings of about Php 1,400,000 per year for government offices.

In addition to the initiatives / innovations of the bureau is the development of mobile application (Beta Version) which is currently under testing phase that allows mobile phone users to access simplified air quality information in the form of Air Quality Index. The public can expect more of such initiatives, as the Bureau continuous to improve its services to the public.
DETAILED PHYSICAL ACCOMPLISHMENTS

I. POLICIES FORMULATED AND APPROVED

a) Designation of the Bued River System Water Quality Management Area and Creation of its Governing Board (DAO 2016-03) *(See attached Annex A)*

The Bued River System Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order *(DAO)* No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural Manual for the Designation of Water Quality Management Areas, and considering its critical importance to Baguio City and the towns of Tuba and Itogon in Benguet and its communities.

b) Designation of Naga River Watershed Water Quality Management Area and the Creation of Its Governing Board (DAO 2016-24) *(See attached Annex B)*

The Naga River Watershed Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order *(DAO)* No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural Manual for the Designation of Water Quality Management Areas, and considering its critical importance to the City of Naga, Province of Camarines Sur and its communities.

c) Designation of the Coron Bay Water Quality Management Area and Creation of Its Governing Board (DAO 2016-05) *(See attached Annex C)*

The Coron Bay Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order *(DAO)* No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural Manual for the Designation of Water Quality Management Areas, and considering its critical importance to the municipality of Coron, Palawan.

d) Designation of the Sabang Bay Water Quality Management Area and Creation of Its Governing Board (DAO 2016-06) *(See attached Annex D)*

The Sabang Bay Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order *(DAO)* No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural
e) **Water Quality Guidelines and General Effluent Standards of 2016 (DAO 2016-08) (See attached Annex E)**

The Water Quality Guidelines and General Effluent Standards of 2016 was adopted and promulgated pursuant to Section 19e and 19f of Republic Act (RA) 9275, otherwise known as the Philippine Water Act of 2004, and the Executive Order 192 (Providing the Reorganization of the Department of Environment, Energy and Natural Resources) dated 10 June 1987.

f) **Designation of Lake Sebu Water Quality Management Area and Creation of Its Governing Board (DAO 2016-14) (See attached Annex F)**

The Lake Sebu Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order (DAO) No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural Manual for the Designation of Water Quality Management Areas, and considering the critical importance to the municipality of Lake Sebu.

g) **Designation of the Ayala River Water Quality Management Area and Creation of Its Governing Board (DAO 2016-15) (See attached Annex G)**

The Ayala River Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order (DAO) No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural Manual for the Designation of Water Quality Management Areas, and considering the critical importance to Zamboanga City and its communities.

h) **Designation of the Tagoloan River Basin Water Quality Management Area and Creation of Its Governing Board (DAO 2016-16) (See attached Annex H)**

The Tagoloan River Basin Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order (DAO) No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural Manual for the Designation of Water Quality Management Areas, and considering its critical importance to many municipalities/city in the Provinces of Bukidnon and Misamis Oriental.
i) **Designation of the Talomo River Water Quality Management Area (WQMA) and Creation of Its Governing Board (DAO 2016-17)** *(See attached Annex I)*

The Talomo River Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order *(DAO)* No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural Manual for the Designation of Water Quality Management Areas, and considering its critical importance to Davao City.

j) **Designation of the Naguilian River System Water Quality Management Area and Creation of Its Governing Board (DAO 2016-18)** *(See attached Annex J)*

The Naguilian River System Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order *(DAO)* No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural Manual for the Designation of Water Quality Management Areas, and considering its critical importance to the municipality of San Fernando City, La Union.

k) **Designation of the Cañas-Maalimango Rivers Water Quality Management Area and Creation of Its Governing Board (DAO 2016-19)** *(See attached Annex K)*

The Cañas-Maalimango Rivers Water Quality Management Area was designated pursuant to Section 5 of RA 9275 otherwise known as the Philippine Water act of 2004, DENR Administrative Order *(DAO)* No. 2005-10 or the Implementing Rules and Regulations of RA 9275, and DENR Memorandum Circular 2009-15 or Procedural Manual for the Designation of Water Quality Management Areas, and considering its critical importance to Manila Bay and the municipality of Cavite.

l) **Adoption of Euro 4/IV Emission Limits / Standards (DAO 2016-23)** *(See attached Annex L)*

Effective 01 January 2016, all new vehicles equipped with Euro 4 engine prior to issuance of Certificate of Conformity shall comply with the annexed United Nation Regulations *(UNR)* 83-05B and UNR 49-04 pursuant to DAO 2015-04 also known as “Implementation of Vehicle Emission Limits for Euro 4/IV, and In-Use Vehicle Emission Standards”.


m) **Providing for New Fees and Charges for Various Services of the Environmental Management Bureau (DAO 2016-28)** *(See attached Annex M)*

The fees and charges for services rendered by the Environmental Management Bureau *(EMB)* was revised and/or updated pursuant to Executive Order No. 197 dated 13 January 2000.

n) **Additional List of Classified Water Bodies (DMC 2016-08)** *(See attached Annex N)*

The additional list of water bodies were officially classified pursuant to DENR Administrative Order *(DAO)* No. 34, Series of 1990 (Revised Water Usage and Classification/Criteria Amending Section Nos. 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations and in accordance with the Manual of Procedure for Water Classification.

o) **Requiring the online submission of Compliance Monitoring Reports (CMR) under the Philippine Environmental Impact Statement System (PEISS) (EMB MC 2016-001)** *(See attached Annex O)*

The DENR Administrative Order No. 2003-30 recognizes the importance of the participation by the project proponents in conducting self-monitoring and submitting semi-annual monitoring reports to the Bureau. The EMB MC 2016-001 requires submission of reports online for the efficient evaluation of the CMRs filed, as well as to establish a database to create trends and accurately monitor project proponents’ performance.

p) **Operation Manuals for the National Water Quality Management Fund (NWQMF) and Area Water Quality Management Fund (AWQMF) (EMB MC 2016-04)** *(See attached Annex P and Annex P-1)*

The Manuals provide guidance and procedures on the assessment, collection, use, disbursement and recording of the NWQMF and AWQMF. The manual for the NWQMF guides the EMB Central Offices, Regional Offices and the Pollution Adjudication Board *(PAB)* on the proper recording and use of the fund while the manual for the AWQMF provides similar directions for the concerned EMB Regional Offices and the Water Quality Management Area Governing Boards.
q) ECC Applicants for Mining Projects including Sand and Gravel Quarry Projects (EMB MC 2016-006) *(See attached Annex Q)*

One of the requirement for the issuance of an ECC is for the applicant to establish authority over the project area. The EMB MC 2016-006 in consistent with the implementation of the PEISS and the Philippine Mining act requires the personality of applicant for mineral agreement should be the same as the personality of the applicant for an ECC.


The EMB MC 2016-008 was issued to provide uniform procedures in the conduct of stack emission testing by DENR-EMB and its accredited TPSETFs.

s) Clarification on the Prohibition of Paints with Lead and Lead Compounds used for Children’s Toys and Related Products (EMB MC 2016-010)
*(See attached Annex S)*

The EMB MC 2016-010 was issued to provide clarification in the implementation of the Chemical Control Order *(CCO)* for Lead and Lead Compounds (DAO 2013-24), particularly in the use of lead and lead compounds in the production and manufacture of paints being used for children’s toys and related products.

t) Instructions on the Implementation and Enforcement of the Devolved Functions under DENR Memorandum Circular No. 2002-12 on the Chemical Control Orders (CCOs), Small Quantity Importation (SQI) and Philippine Inventory of Chemicals and Chemical Substances (PICCS) Certification (EMB MC 2016-011) *(See attached Annex T)*

The EMB MC 2016-011 was issued to provide clarification in the implementation and enforcement of the devolved functions under the DENR Administrative Order No. 2002-12 (Delegation of Authority to the EMB Regional Offices to Issue Permit to Transport for Hazardous Waste and Certification and Importation Clearance for Chemicals and Chemical Substances), EMB Memorandum Circular No. 2014-001 *(Philippine Inventory of Chemicals and Chemical Substances)* and EMB Memorandum Circular No. 2015-002 (Harmonization of Registration Forms, Issued Certificates and Procedures for CCOs and SQI).
u) EMB Approved Methods of Analysis for Water and Wastewater (EMB MC 2016-012) *(See attached Annex U)*

The EMB MC 2016-012 shall be used as reference for laboratories in the conduct of testing of water (freshwaters, groundwater, marine waters) and wastewater in accordance with the latest edition of the “Standard Methods for the Examination of Water and Wastewater” published by the American Public Health Association/American Water Works Association/Water Environment Federation (APHA/AWWA/WEF), the latest edition of the United States Environmental Protection Agency (US EPA) test methods contained in SW-846: *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, and/or in accordance with such other methods of analysis as the EMB may prescribe.

II. MAJOR PROGRAMS AND PROJECTS IMPLEMENTED

CLEAN AIR

Nationwide Air Quality

To ensure that the data gathered by the monitoring stations are complete and accurate, monthly maintenance and regular calibration is performed. There are a total of 4 Real Time Air Quality Monitoring stations and one mobile monitoring station operated, maintained and regularly calibrated by the Ambient Monitoring Team of Central Office. For the data gathered from the station, quarterly data management and QA/QC report is done. This ensures the correctness of the data reports. With regards to the emission inventory of sources, data is also assessed every quarter.
Aside from the management of web based AQM data, a mobile application (Beta version) was developed for Android phone users and currently under testing phase (See Figure 1). The mobile application will enable mobile phone users to access simplified air quality information in the form of Air Quality Index.

**Emission Inventory**

The transport sector continues to be the number one (1) contributor to the country’s air pollution problem. National Emission Inventory of 2012 conducted by the EMB points to motor vehicles (69%) as the major source of air pollution; followed by area sources (22%); and stationary/industry sources (9%) (See Figure 2).
Similarly, emission inventory for the National Capital Region (NCR) shows that mobile sources has the biggest load contribution (90%), followed by area sources (9%) and stationary sources (1%) *(See Figure 3)*. Monitoring of vehicle emission remains to be a challenge to the country, specifically, for the Department of Transportation (DOTr).

![NCR Emission Inventory 2012](image)

**Figure 3: NCR Emission Inventory 2012**

**Total Suspended Particulate (TSP)**

The country’s air quality still exceeds the DENR guideline value of 90 µg/Ncm. Through the efforts of the bureau to increase compliance of both stationary and mobile sources with the standards and policies set forth under the Clean Air Act, the nationwide TSP level for CY 2016 showed 14% decrease compared to 2010 level *(2010 Result: 104 µg/Ncm vs 2016 Result: 89 µg/Ncm)*. *(See Figure 4)*

![Nationwide Air Quality Status](image)

**Figure 4: Nationwide Air Quality Status 2010 – 2016 (TSP)**
The Bureau had been diligent in the performance of its duties to improve the air quality. It should be noted however, that EMB’s main mandate in air pollution control is over industrial sources. Nevertheless, the DENR through the EMB had rendered full support in the control of pollution coming from mobile sources although the Clean Air Act stipulates that the Department of Transportation and Communication (DOTC) shall implement the emission standards for motor vehicles.

**Particulate Matter 10 (PM$_{10}$)**

Inhalable particles less than 10 micrometers ($\mu$m) in diameter used as nominal surrogate for particles between 2.5$\mu$m and 10$\mu$m in diameter; found near roadways and dusty industries. For CY 2015, progressive improvement had been achieved (2011 Result: 76 $\mu$g/Ncm vs 2016 Result: 39 $\mu$g/Ncm) as the nationwide PM$_{10}$ level was still within the air quality guideline value of 60 $\mu$g/Ncm (See Figure 5).

![Nationwide Air Quality Status (PM$_{10}$)](image)

*Figure 5: Nationwide Air Quality Status 2011 – 2016 (PM$_{10}$)*
Metro Manila’s Air Quality

Total Suspended Particulate (TSP)

Congested main roads and major intersections are projected to register further deterioration in air quality unless drastic innovations in the transport system, fuel and additives composition and traffic management are put in place.

The 2016 TSP results still exceed the air quality guideline value of 90 µg/Ncm but showed a 39% improvement in the concentrations decreasing from 166 µg/Ncm in the 1st semester of 2010 to 101 µg/Ncm in the 2nd semester of 2016 (See Figure 6).

![Metro Manila Air Quality Status (TSP)](image)

**Figure 6: Metro Manila Air Quality Status (Semi-Annual 2010 – 2016) (TSP)**
Particulate Matter 10 (PM\textsubscript{10})

The data below shows the result of PM\textsubscript{10} level for 2016 as having passed the international standard of 60 µg/Ncm. A significant 45% decrease in concentration was noted from January-June 2011 to July to December of 2016. (\textit{From 85 µg/Ncm to 47 µg/Ncm}) (\textit{See Figure 7}).

![Metro Manila Air Quality Status (PM\textsubscript{10})](image)

\textit{Figure 7: Metro Manila Air Quality Status (Semi-Annual 2011 – 2016) (PM\textsubscript{10})}

Motor Vehicle Emission Management Program

The management of new motor vehicle emission was done through the issuance of Certificate of Conformity (\textit{COC}). The Bureau has issued 245 COCs for Motor Vehicles (\textit{MV}) and 126 COCs for Motorcycles (\textit{MC}). A total of 371 COCs were issued for CY...
2016. All COCs are issued online through Online Permitting and Monitoring System (OPMS).

For in-use vehicles, the Bureau conducts garage emission testing. Garage testing includes free emission testing, Information and Education Campaign (IEC) on fuel efficiency and management and regular vehicle maintenance. Out of 179 visited garage, 6,068 vehicles were tested (2,924 passed while 3,144 failed to pass the vehicle emission standard).

In order to ensure that the smokemeter used in the apprehension of vehicles by EMB and other agencies, the Bureau conducts calibration of these equipment. The opacimeter of agencies/LGUs implementing ASBU are calibrated upon request with a total of 49 calibrations conducted.

Industrial Emission Management Program

The Industrial Emission Management Program ensures compliance of industries to the emission standards set by the Bureau. Thus, issuance of permit and regular monitoring is done. With the increasing number of stationary sources, extensive monitoring is required. In order to monitor all sources with potential to emit air pollution, the Bureau accredits Third Party Source Emission Testing Firms (TPSETF) to carry out emission test and effectively perform sampling activities in accordance with the provisions of Clean Air Act and Implementing Rules and Regulations.

For CY 2016, thirteen (13) new teams are accredited and one (1) team renewed their accreditation. Accreditation process of applicants includes written and oral examinations with actual performance test headed by the SAT Team.

To ensure that the testing firms follow the guidelines on proper testing procedure, the Sampling Assessment Team (SAT) of EMB conducts random monitoring / observation of their performance. For the year, a total of 19 stack emission test monitoring were accomplished by AQMS SAT Team within Metro Manila, Region 3 and Region 4A. Aside from the manual stack testing, SAT also conducted Seven (7) observation of RATA/ RAA/ CGA.
General Ambient and Roadside Ambient Air Quality Monitoring Program

This refers to the monitoring of ambient air quality thru sampling of particulates (TSP, PM10 & PM2.5) and gases (SO2, NO2, O3, CO, & BTX). As of CY 2016, there are ninety eight (98) air quality monitoring stations nationwide. These monitoring stations are being managed by Central and Regional Office Technical Personnel.

Management of the air quality monitoring stations includes technical visit, maintenance and management of data acquisition, FTP, and web server. The server is located in EMB Central Office and being managed by the Environmental Quality Division - Air Quality Management Section.

Airsheds

A total of twenty two 22 airsheds, five (5) of which are geothermal, have already been designated with their Governing Boards (See Figure 8). Implementation of Action Plans varies among regions. To some extent, operationalization of airsheds and governing boards are still dependent on the budget releases from the Air Quality Management Fund (AQMF) by the Department of Budget and Management (DBM). Other fund sources include the LGUs’ Internal Revenue Allotment and Special Vehicle Control Fund of the DOTC.

Figure 8: Map of 22 Airsheds Nationwide
CLEAN WATER

Adopt-an-Estero Waterbody Program

Under the Adopt-an-Estero Waterbody Program, the Bureau encourages private establishments/institutions, Non-Government Organizations (NGO) or industry associations to enter into a Memorandum of Agreement (MOA) and be the major actor in cleaning the esteros Nationwide. The donor partner may personally select an estero / waterbody of their choice or may collaborate with other establishments to clean the entire stretch of the estero.

The Bureau ensures that the baseline water quality data of the piloted waterbodies are pre-determined prior the MOA signing or implementation of any clean-up activities. Photo documentation forms an important part of the data gathering. EMB also provided seminars and trainings on Solid Waste Management and Project Implementation Planning Workshop to capacitate Donor-Partners as well as the representatives of partners-Barangays. The formation of estero/waterbody council was also pushed for each adopted estero. In this way, ownership of the estero is instilled on the LGU/Barangay.

As the country continues to find more efficient means of addressing its solid waste problem, the Adopt-an-Estero/Waterbody Program serves as a source of inspiration for all its key players’ government, private sector, barangay officials and the residents themselves to act now and take the lead in improving their waterways and eventually their environment and lives.

Based on the adopted esteros/waterbodies monitored from 2012 to 2016, 89 waterbodies had shown water quality improvements in terms of Dissolved Oxygen (DO) and 68 had shown water quality improvement in terms of Biochemical Oxygen Demand (BOD).

As of CY 2016, there are sixty four (64) new esteros/waterbodies (4 each region) and brings the total number of adopted esteros to 456 (See Annex V).
Clean-up activities were also undertaken to reduce solid wastes and floating debris along esteros/waterbodies. A total of 33 truckloads, 9003 sacks and 140,209 kilos of biodegradable and non-biodegradable waste materials were recovered during the clean-up activities that were participated by more than 30,470 people in different organizations/sector. This is just a reflection of the corporate entities’ and local government units’ commitment to help restore the waters all over the Philippines.

**Spine Creek (Caloocan City)**
Clean-up Activity (September 17, 2016)

**Ello-Zagala Creek (Dasmariñas, Cavite)**
Clean-up Activity (September 17, 2016)
NIA Canal District II (Antique)
Clean-up Activity (September 17, 2016)

Jagobiao Creek (Mandaue City, Cebu)
Clean-up Activity (September 17, 2016)
Zamboanga Channel Creek (Zamboanga City)
Clean-up Activity (March 16, 2016)

Kauswagan Creek (Cagayan de Oro City)
Clean-up Activity (June 25, 2016)
Bulok Creek (Koronadal City)
Clean-up Activity (June 25, 2016)

Water Quality Management Area (WQMA)

The designation of Water Quality Management Areas (WQMA) is governed by the Philippine Clean Water Act of 2004 or RA 9275 under Section 5 which states that “The Department of Environment and Natural Resources (DENR) in coordination with the National Water Resources Board (NWRB), shall designate certain areas water quality management areas using appropriate physiographic units such as watershed, river basins or water resources regions. Said management areas shall have similar hydrological, hydrogeological, meteorological or geographic conditions which affect the physiochemical, biological and bacteriological reactions and diffusions of pollutants in the water bodies or otherwise share common interest or face similar development programs, prospects or problems.”

In CY 2016, there are additional 10 designated WQMA and 20 WQMA operationalized. The following are the lists of newly designated WQMAs:

<table>
<thead>
<tr>
<th>No.</th>
<th>DAO No.</th>
<th>WQMA</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DAO 2016-03</td>
<td>Bued River System</td>
<td>CAR</td>
</tr>
<tr>
<td>2</td>
<td>DAO 2016-04</td>
<td>Naga River Watershed</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>DAO 2016-05</td>
<td>Coron Bay</td>
<td>4B</td>
</tr>
<tr>
<td>4</td>
<td>DAO 2016-06</td>
<td>Sabang Bay</td>
<td>4B</td>
</tr>
<tr>
<td>5</td>
<td>DAO 2016-14</td>
<td>Lake Sebu</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>DAO 2016-15</td>
<td>Ayala River</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>DAO 2016-16</td>
<td>Tagoloan River Basin</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>DAO 2016-17</td>
<td>Talomo River</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>DAO 2016-18</td>
<td>Naguilian River System</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>DAO 2016-19</td>
<td>Cañas-Maalimango Rivers</td>
<td>4A</td>
</tr>
</tbody>
</table>
As of CY 2016, there are thirty one (31) officially designated WQMAs, including the areas within the jurisdiction of LLDA which was designated as one management area by virtue of the Clean Water Act (See Figure 9).

### Classification of Waterbodies

A total of 761 waterbodies have been classified in terms of best usage and water quality to be maintained, 27 of which in CY 2016. There are 308 classified principal rivers or rivers with drainage areas of not less than 40 sq. km. This accounts to 73.16% of the country’s 421 principal rivers identified by the National Water Resources Board (NWRB).

To summarize, Region 4B has the largest number of classified water bodies with (73) followed by Region 6 with (72), Region 5 with (63), Region 3 with (62), Region 4A with...
(57), Region 8 with (55), Region 9 with (48) followed by Region 2, Region 7, Region 10 and Region 12 with (47 each), followed by the Cordillera Administrative Region and CARAGA Region with (38 each) Regions 11 with (36) Region 1 with (25) and finally, the National Capital Region with (6) classified water bodies (See Annex W).

Sagip Ilog Program

Under the Sagip Ilog Program, EMB has selected 19 priority rivers for monitoring. Out of 19 rivers monitored, only 6 or 31% passed the 5.0 mg/L Dissolved Oxygen (DO) criterion while only 7 or 37% passed the 7.0 mg/L BOD criterion.

Results of Water Quality Monitoring of 19 Priority Rivers:

<table>
<thead>
<tr>
<th>Region</th>
<th>Waterbody</th>
<th>Class</th>
<th>DO mg/L</th>
<th>BOD mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>Meycauayan River</td>
<td>C</td>
<td>0.88</td>
<td>88.67</td>
</tr>
<tr>
<td></td>
<td>Marilao River</td>
<td>C</td>
<td>2.06</td>
<td>43.48</td>
</tr>
<tr>
<td></td>
<td>Bocaue River</td>
<td>C</td>
<td>2.52</td>
<td>27.03</td>
</tr>
<tr>
<td>IVA</td>
<td>Imus River</td>
<td>C</td>
<td>5.09</td>
<td>10.63</td>
</tr>
<tr>
<td></td>
<td>Ylang-Ylang River</td>
<td>C</td>
<td>4.6</td>
<td>4.9</td>
</tr>
<tr>
<td>IVB</td>
<td>Tagburos River</td>
<td>C</td>
<td>4.81</td>
<td>9.65</td>
</tr>
<tr>
<td></td>
<td>Calapan River</td>
<td>C</td>
<td>1.3</td>
<td>6.39</td>
</tr>
<tr>
<td>V</td>
<td>Salog River</td>
<td>C</td>
<td>5.81</td>
<td>3.55</td>
</tr>
<tr>
<td></td>
<td>Balos River</td>
<td>C</td>
<td>7</td>
<td>2.00</td>
</tr>
<tr>
<td></td>
<td>Sagumayon River</td>
<td>C</td>
<td>4.11</td>
<td>22.16</td>
</tr>
<tr>
<td>VI</td>
<td>Iloilo River</td>
<td>C</td>
<td>4.00</td>
<td>8.70</td>
</tr>
<tr>
<td>VII</td>
<td>Luyang River</td>
<td>C</td>
<td>8.3</td>
<td>5.30</td>
</tr>
<tr>
<td></td>
<td>Sapangdaku River</td>
<td>C</td>
<td>7.94</td>
<td>2.42</td>
</tr>
<tr>
<td>X</td>
<td>Cagayan de Oro River</td>
<td>A</td>
<td>7.39</td>
<td>1.04</td>
</tr>
<tr>
<td>CAR</td>
<td>Balili River</td>
<td>NC</td>
<td>5.9</td>
<td>59.50</td>
</tr>
<tr>
<td>NCR</td>
<td>Marikina River</td>
<td>C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>San Juan River</td>
<td>C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Parañaque River</td>
<td>C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Pasig River</td>
<td>C</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Recreational Waters (Bathing Beaches) Monitoring

There are 162 recreational water bodies that were monitored in 2016. Seventy six (76) or 47% are within the 100 MPN/100 mL water quality guideline for SB waters while 86 or 53% exceeded the allowable fecal coliform count (See Annex X).
MANILA BAY

Monitoring of Bathing Beaches

To determine pathogens contamination of bathing beaches in Manila Bay nineteen (19) stations were monitored for total and fecal coliform count, (See Figure 10). Data derived from the monitoring showed that only one (1) out of the Nineteen (19) stations passed the SB criteria of 1000 mpn/100 ml for Total Coliform while all stations failed the SB criteria for Fecal Coliform of 100 mpn/100 ml. Other parameters such as DO, pH, and total suspended solids were also monitored. Four (4) stations conformed to the DO criteria of 6 mg/L while fourteen (14) stations passed the criteria for pH. For TSS, seven (7) stations monitored by the NCR and Region III conformed the criteria of 50 mg/L.

High levels of pathogens may result from on – site sanitation systems (septic tanks, pit latrines) or inadequately treated sewage discharges. In some areas, combined sewers which may discharge untreated sewage during rain storms. Pathogen discharges may also be caused by poorly managed livestock operations. Coliform bacteria, which are not an actual case of disease, are commonly used as a bacterial indicator of water pollution.
Baywide Monitoring

Nine (9) stations Baywide in Manila Bay were monitored for DO, pH, Salinity, Temperature, Conductivity and Total Suspended Solids. A decreasing trend of Dissolve Oxygen (DO) from top to bottom was observed in all stations except in station 5 where the value of the bottom DO is higher than the mid – depth DO. Surface DO conformed to the criteria of 6 mg/L in all stations while only 4 stations conformed at mid – depth. For bottom DO, all stations failed the DO criteria.

High levels of pH ranging from 7.68 to 8.24 were observed in the bay. Potential Hydrogen values are affected by the excess hydrogen H⁺ present in sea water. This excess hydrogen is affected by the Carbon cycles in photosynthetic activities by phytoplankton and algae.

The high pH value attributed to Photosynthetic action by phytoplankton and photosynthetic microorganisms since they have to break down carbonate ions consuming free hydrogen ions into aqueous Carbon dioxide and water.

River / Estero Clean-up

Tanque Creek Clean – up

<table>
<thead>
<tr>
<th>Organized by:</th>
<th>DENR EMB – MBO in cooperation with EMB – NCR, LGUs and Different Agencies from the Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Participants:</td>
<td>300</td>
</tr>
<tr>
<td>Volunteers:</td>
<td>The Residents of Brgy. Sta. Cruz, Quezon City and Private Sector Partners</td>
</tr>
<tr>
<td>Volume of Waste Collected:</td>
<td>239 sacks of garbage</td>
</tr>
</tbody>
</table>
Abacan River Clean-up

<table>
<thead>
<tr>
<th>Organized by:</th>
<th>DENR EMB – MBO and EMB – R3 in cooperation with the Local Government Units (LGUs) of Angeles City, Pampanga</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Participants:</td>
<td>300</td>
</tr>
<tr>
<td>Volunteers:</td>
<td>The Residents near Abacan River, Municipal Government Staff of Angeles City and Private Sector Partners</td>
</tr>
<tr>
<td>Volume of Waste Collected:</td>
<td>100 sacks of garbage</td>
</tr>
</tbody>
</table>

SOLID WASTE MANAGEMENT

Technical Assistance in the Implementation of RA 9003

As of December 2016, a total of one thousand nine hundred seventy eight (1,978) technical assistance provided to LGUs in the formulation of 10-Year Solid Waste Management (SWM) Plan, establishment and operationalization of Materials Recovery Facility (MRF) and closure and rehabilitation of illegal dumpsites.
Approval of 10-Year Solid Waste Management Plan

Section 16 of RA 9003 provides that the province, city or municipality, through its local solid waste management boards, shall prepare its respective 10-Year solid Waste Management Plans consistent with the National Solid Waste Management Framework. The Plan shall contain all the components provided in Section 17 of the Act and a timetable for the implementation of the solid waste management program. All local government solid waste management plans shall be subjected to the approval of the National Solid Waste Management Commission (NSWMC).

Technical assistance in the development / formulation / updating of 10-Year SWM Plans including conduct of Waste Analysis and Characterization Study (WACS), plan preparation and pre-WACS orientation was provided.

A total of eight hundred thirty three (833) 10-Year SWM Plan were approved out of the one thousand four hundred and eight (1,408) SWM Plans submitted by the LGUs (See Attached Annex Y and Annex Y-1).

Support in the Establishment and Monitoring of Materials Recovery Facility (MRF)

The establishment of MRF is a scheme to reduce the amount of garbage being disposed and the production of GHG (methane) coming from domestic and commercial biodegradable wastes through the process of composting/vermin-composting instead of disposing to landfills. Technical support were provided in the establishment of 9,883 MRFs servicing 13,155 barangays nationwide (See Figure 11 and Annex Z).

![Materials Recovery Facility](image)

**Figure 11:** MRF established and Barangay served from 2010 - 2016
Closure and Rehabilitation of Illegal Dumpsites

Regular monitoring and technical assistance are continuously being conducted by the Bureau to the LGUs for the closure of illegal disposal facilities. Significant decrease was noted from 553 illegal dumpsites in CY 2015 to 511 in CY 2016. As of December 2016, there are 118 operational Sanitary Landfill nationwide (See Figure 12 and Annex AA and Annex AA-1).

Figure 12: Disposal Facilities

“Bayan Ko, Linis ko”

Massive clean-up activities adopting ridge to reef approach, dubbed as “Bayan Ko, Linis Ko” was held all over the country last 17 September 2016 for the National Clean-up Day organized by the DENR-EMB in collaboration with LGUs, NGOs, academe and private sector.
A total of 771 LGUs participated with 11,819 clean-up groups registered, 159,638 volunteers and 1,267 sites (barangays, schools, creeks, various waterways, coastal and other areas) cleaned nationwide.

III. FOREIGN ASSISTED AND SPECIAL PROJECTS IMPLEMENTED

(Kindly see attached Annex BB)

IV. GENDER AND DEVELOPMENT MAINSTREAMING

In support for the Gender and Development (GAD) Program, the following were undertaken:

Workshop on Gender and Development Mainstreaming and Monitoring System

Date: January 19-21, 2016
Venue: Sunrise Holiday Mansion, Tagaytay City

Seminar on Urban Gardening

Date: March 7, 2016
Venue: EMB-AQMT, DENR Compound, Visayas Avenue, Diliman, Quezon City
Forum on “Kapakanan ni Juana.. Isama sa Agenda”

March 14, 2016

Venue: EMB-AQMTC, DENR Compound, Visayas Avenue, Diliman, Quezon City

Supported Women’s Month Celebration

Date: March 16, 2016

Venue: Quirino Grandstand, Manila

Seminar-Workshop on Gender Sensitivity and Gender Analysis for EMB Central Office GAD Committee Members

Date: August 04-05, 2016

Venue: Hotel Xenia, Clark, Pampanga
Conduct of Trainers’ Training on Mainstreaming Gender and Development (GAD) Concerns in Programs for EMB Regional GAD Focal Points and Planning Officers

Date: October 12-13, 2016
Venue: Baler, Aurora

V. OTHER SIGNIFICANT ACCOMPLISHMENTS / MILESTONES / BREAKTHROUGHS

COMPLIANCE MONITORING OF FIRMS

For CY 2016, the table below shows compliance monitoring conducted, with corresponding Notices of Violations (NOVs) that were issued for RAs 8749, 9275, 6969 and PD 1586.

Table 1: Firms Monitored and NOVs Issued for CY 2016

<table>
<thead>
<tr>
<th>Details</th>
<th>Air</th>
<th>Water</th>
<th>Chemicals</th>
<th>Hazwaste</th>
<th>ECAs / ECPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permits Issued</td>
<td>12,278</td>
<td>6,268</td>
<td>5,858</td>
<td>11,922</td>
<td>3,502</td>
</tr>
<tr>
<td>Monitored</td>
<td>15,198</td>
<td>6,704</td>
<td>1,349</td>
<td>10,981</td>
<td>14,323</td>
</tr>
<tr>
<td>NOV Issued</td>
<td>1,560</td>
<td>977</td>
<td>327</td>
<td>1,351</td>
<td>2,093</td>
</tr>
<tr>
<td>Percentage of Compliance</td>
<td><strong>89%</strong></td>
<td><strong>85%</strong></td>
<td><strong>76%</strong></td>
<td><strong>88%</strong></td>
<td><strong>85%</strong></td>
</tr>
</tbody>
</table>
ENVIRONMENTAL IMPACT ASSESSMENT

Mining Audit as provided in DMO 2016-001

Sixteen (16) mining audit teams were created to conduct the mine audit, composed of representative from DENR Central Office, DENR Assistant Regional Director for Technical Services, MGB, EMB and Civil Society organizations.

Of the 41 metallic mining firms audited, 10 mining firms were suspended after the audit and 20 mining firms were recommended for suspension.


In addition to 41 operating mines audited, the following were also audited by MGB, EMB and BMB.

1. Rapid City Realty
2. Semirara Mining Corporation
3. Austral Asia Link Mining Corp.
4. Sagittarius Mines Inc.
5. Century Communities
6. Rock Energy

Notice of Adverse Findings (NAF) were issued to the above firms except for Rapid City Realty.
EIA Audit

50 ECPs were selected for ECC audit in accordance to Project Environmental Monitoring & Audit Prioritization Scheme (PEMAPS). Of the 50 ECPs, 11 projects were issued with Notice of Adverse Findings/ show cause orders for failure to comply with their ECC conditions.

Nine (9) ECCs were cancelled for not implementing within five (5) years from issuance of their ECCs.

CLIMATE CHANGE

Clean Development Mechanism

The Clean Development Mechanism (CDM) was introduced by the Kyoto Protocol as one of the three (3) flexibility mechanisms primarily to assist developed countries able to meet their emission reduction targets at a least cost and at the same time help developing countries achieve their sustainable development goals and objectives. In its interest to participate in the CDM, the Philippine government ratified the Kyoto Protocol in 2003 which was followed by the designation of the Department of Environment and Natural Resources (DENR) as the National Authority for CDM (DNA) with the EMB serving as the CDM Secretariat with an issuance of Executive Order 320 on 2004. The chart below (See Figure 13) shows the distribution of about 7,747 registered projects by host party as of 30 November 2016.
As of 30 November 2016, the Philippines ranked No. 12 in terms of the number of CDM project activities registered globally having registered 70 project activities most of which are on renewable energy projects expected to generate an estimated average annual CERs (Certified Emission Reduction Units) of 3,490,997 tCO₂e (Tons of Carbon Dioxide Equivalent). Ten (10) of which have been issued about 2,180,194 carbon credits or CERs altogether as shown in Table 2.

**Table 2: Ten Registered CDM projects with Certified Carbon Credits Issued**

<table>
<thead>
<tr>
<th>Name of CDM Project Activity</th>
<th>Total Issued CERs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bataan 2020 12.5 MW Power Rice Hull Cogeneration Project</td>
<td>118,174</td>
</tr>
<tr>
<td>Crediting Period: 11 March 2011 to 10 March 2018</td>
<td></td>
</tr>
<tr>
<td>2. San Carlos Renewable Energy Project</td>
<td>21,442</td>
</tr>
<tr>
<td>Crediting period: 1 Nov 2008 to 31 Oct 2015</td>
<td></td>
</tr>
<tr>
<td>3. NorthWind Bangui Bay Project</td>
<td>321,009</td>
</tr>
<tr>
<td>Crediting period: 1 May 2005-30 April 2012 and subsequent period 01 May 2012- 30 Apr 2019</td>
<td></td>
</tr>
<tr>
<td>4. Quezon City Controlled Disposal Facility Biogas Emission Reduction Project</td>
<td>585,736</td>
</tr>
<tr>
<td>Crediting period: 8 Feb 2008 to 31 Jan 2018</td>
<td></td>
</tr>
</tbody>
</table>
5. **Philippine Sinter Corporation Sinter Cooler Waste Heat Recovery Power Generation Project**  
   Crediting period: 08 Sep 2008 to 07 Sep 2018  
   **122,675**

6. **Hedcor Sibulan 42.5 MW Hydroelectric Power Project**  
   Crediting period: 26 Feb 2010-25 Feb 2017  
   **410,776**

7. **Wastewater treatment using a Thermophilic Anaerobic Digestor at an ethanol plant in the Philippines**  
   Crediting period: 30 June 2008 to 29 June 2015  
   **94,990**

8. **Ambuklao Hydro Electric Power Plant (AHEPP) rehabilitation project**  
   Crediting period is from 1 July 2011 to 30 June 2018  
   **494,318**

9. **Superior Hog Farms Methane Recovery**  
   Crediting period is from 7 Sep 2007 to 6 Sep 2014  
   **5,437**

10. **Joliza Farms Inc. Methane Recovery**  
    Crediting period 1 Nov 2006 to 31 October 2013  
    **5,637**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,180,194</strong></td>
<td></td>
</tr>
</tbody>
</table>

Such projects have provided benefits to the country through the provision of technologies mostly on methane recovery and electricity generation from swine and poultry wastewater, landfill gas recovery and power generation, renewable energy technologies such as wind, hydropower, solar and geothermal, among others which in turn facilitated the generation of livelihood and employment opportunities in the communities, provision of free education, training and skills development among the youth, generally addressed improvement of environmental quality and ultimately, uplifted the socio-economic status of the residents.

**Carbon Sequestration Investment**

The Paris Agreement, under Article 5, encourages parties to conserve, enhance, as appropriate, sinks and reservoirs of greenhouse gases which includes the likes of forests. In view of this, the DENR seeks the establishment of a Carbon Sequestration Investment (CSI) Mechanism to pursue a low – carbon development and sustainable pathway. The CSI is an enabling mechanism that encourages private sector investments in sustainable forest management by providing incentives in a form of carbon sequestration certificates (CSC) to entities that invest in long-term, sustainable, and socially inclusive models of utilization of Forest lands and alienable & disposable lands as a climate change adaptation and mitigation strategy by reducing emissions from deforestation and forest
degradation through the sustainable management of forests and the protection and enhancement of carbon stocks.

The CSI calls for an establishment of a carbon sequestration accounting, verification, and certification system which also provides a mechanism for monitoring of compliance of those companies required to establish reforestation program under the Environmental Compliance Certificates (ECC). In this regard, EMB has conducted a series of focus group discussion with the private sectors to establish the said system. Further, the draft Department Administrative Order (DAO) on CSI has been integrated with another DAO on Carbon Neutrality Mechanism of FMB and is now being reviewed by both Bureaus.

**Greenhouse Gas Accounting for Industries / Private Sectors**

In line with the EMB’s capacity development program on climate change mitigation, a series of three (3) nationwide training-workshops on Greenhouse Gas Accounting and Management have been conducted among Pollution Control Officers (PCOs) in the industry/private sectors throughout the year. In cooperation with the Pollution Control Association of the Philippines, Inc. (PCAPI) and the Philippine Chamber of Commerce and Industry (PCCI), the workshops aimed toward raising awareness and building capacities in conducting the greenhouse gas (GHG) inventory and management. It is likewise envisaged that the GHG inventory process be institutionalized in every industry as this would later facilitate inputs to the proposed enhancement of the Self-Monitoring Reports (SMR) and its reporting requirements and procedure in the near future. Also joined in by the respective EMB Regional Focal Persons on Climate Change and GHG Inventory Teams, each workshop was participated in by close to 40 participants from different industry sectors in the regions.

**Climate Change Adaptation**

As part of mainstreaming climate change in EMB policies, local and national plans, and capacity development on climate change adaptation for National Government Agencies (NGAs), and Local Government Units (LGUs), EMB through its CCD also initiated the promotion and capacity building on Ecosystems-based Adaptation (EbA) approach.

EbA is a climate change adaptation approach that utilizes the natural resilience of ecosystems and the services it provides, in order for communities to cope with climate change impacts and to pursue sustainability. EMB in partnership with GIZ, FMB, and BMB conducted workshops, and focus group discussions which aimed to integrate EbA into national and local plans. After which, a series of regional orientation and workshop on EbA for LGUs and Regional Offices was shepherded by EMB in support of GIZ, ERDB, and CCC. The event was also a venue for orientation and preparation of proposals for the People’s Survival Fund.
EMB commenced its series of regional cluster orientation-writeshops in mainstreaming Ecosystem-based Adaptation (EbA) in support to the DENR’s Program on promoting the development of model communities on area management and convergence highlighting green and resilient communities showcasing best practices in climate change adaptation and mitigation.

This current undertaking which generally aims to contribute to the country’s achievement of ecosystem-resilience and ecological integrity is in response to the DENR Secretary’s directive and proposed agenda initiatives for the first 100 days on pursuing convergence among national government agencies and relevant stakeholders such as the local government planners, academe/research institutions and civil society groups in addressing issues on climate change.

DENR-EMB envisions the promotion and establishment of model communities/LGUs which have demonstrated enhanced adaptive capacities particularly for vulnerable communities while at the same time pursue low carbon development through the use of renewable energy sources.

The EbA Orientation series for regional clusters serve as an opportunity for DENR regional staff to have updated and working knowledge on climate change adaptation guided by the EbA Mainstreaming Cycle and practice their updated knowledge and facilitation skills in assisting vulnerable communities to come up with specific adaptation action agenda in the form of project proposals that are doable with community initiatives and mobilization. Such proposals shall be presented/submitted for possible support of either the People’s Survival Fund (PSF) or DENR funds (44 proposals formulated during the writeshop).

The People’s Survival Fund (PSF) was created pursuant to Section 18 of Republic Act 9729 (Climate Change Act of 2009), as amended by Republic Act No. 10174 in 2012 which is a special fund in the National Treasury for the financing of adaptation program and projects based on the National Strategic Framework. Having an annual appropriation of 1 billion pesos, the PSF will fund climate change projects as proposed by LGUs or local communities/organizations (LCOs).

The EMB Regional Offices shall continue the coordination with the respective LGU/civil society organization project proponents and monitor progress of these proposals to ensure that they successfully avail support from the PSF.

**Carbon Mini-Olympics (MCO)**

The MCO aims to recognize public high schools for measures that they have undertaken to curb emissions in their school’s operations. Apart from this, the project also endeavored to raise the awareness of school administrators, teachers and students on the issue of climate change and train the teachers on how to calculate their school’s carbon footprint and integrate this in their lesson plans.
The Awarding Ceremonies for the Mini(mize) Carbon Olympics (MCO) was held last February 9, 2016 at Conference Room A of the Air Quality Management and Training Center, Environmental Management Bureau, DENR Compound, Visayas Avenue, Quezon City. This is in partnership with the Earth Day Network Philippines Incorporated (EDNPI) and the Department of Education.

Sta. Lucia High School (Rosario, Pasig City) and Caybiga High School (Caloocan City) received the Least Increase in Carbon Emission Award for the least consumption of electricity and fuel use among public high schools who participated in the MCO.

National Climate Change Consciousness Week

In support to the celebration of the Climate Change Consciousness Week, the conduct of a Science and Policy Forum entitled “Lake Ecosystems Assessment in the Philippines (LEAP) 2016” is held on November 22 – 23, 2016 at Summit Ridge Tagaytay, Tagaytay City, Cavite. The forum is a collaboration of the Department of Environment and Natural Resources (DENR), University of the Philippines (UP), the Department of Science and Technology (DOST), and Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ). It aims to provide the most recent set of information for setting the future directions of Laguna Lake by looking at its bio-geophysical characteristics, pollution levels, watershed changes, and the vision of the community towards the lake development. These set of information will be utilized to formulate science-based policies for the integrated management of Laguna de Bay, and hopefully for other large urban lakes.

TOXIC SUBSTANCES AND CHEMICALS MANAGEMENT

The Bureau continuously regulates chemicals which were deemed to pose risk to human health and environment. Risk assessment and evaluation process is done on every application for permits received. Among the permits issued are as follows:
Central Office

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>1st Qtr TOTAL</th>
<th>2nd Qtr TOTAL</th>
<th>3rd Qtr TOTAL</th>
<th>4th Qtr TOTAL*</th>
<th>GRAND TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. PCL</td>
<td>207</td>
<td>161</td>
<td>122</td>
<td>124</td>
<td>614</td>
</tr>
<tr>
<td>b. PMPIN</td>
<td>33</td>
<td>56</td>
<td>24</td>
<td>24</td>
<td>137</td>
</tr>
<tr>
<td>c. PSIC (ODS)</td>
<td>160</td>
<td>156</td>
<td>122</td>
<td>86</td>
<td>524</td>
</tr>
<tr>
<td>d. Certificate of Registration (ODS)</td>
<td>61</td>
<td>33</td>
<td>47</td>
<td>35</td>
<td>176</td>
</tr>
<tr>
<td>e. CCO Registration / Amendment</td>
<td>3</td>
<td>18</td>
<td>5</td>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>f. CCO Importation Clearance</td>
<td>69</td>
<td>69</td>
<td>46</td>
<td>30</td>
<td>214</td>
</tr>
<tr>
<td>g. PCL Exemption</td>
<td>35</td>
<td>26</td>
<td>25</td>
<td>13</td>
<td>99</td>
</tr>
<tr>
<td>Add. Information (CCO application)</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Letter</td>
<td>111</td>
<td>185</td>
<td>144</td>
<td>98</td>
<td>538</td>
</tr>
<tr>
<td>Memorandum</td>
<td>26</td>
<td>51</td>
<td>31</td>
<td>19</td>
<td>127</td>
</tr>
<tr>
<td>Special Order</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td>Warning / NOV letter</td>
<td>11</td>
<td>24</td>
<td>6</td>
<td>3</td>
<td>44</td>
</tr>
<tr>
<td>Polymer Exemption</td>
<td>17</td>
<td>36</td>
<td>28</td>
<td>13</td>
<td>94</td>
</tr>
<tr>
<td>Notice of Commencement</td>
<td>25</td>
<td>15</td>
<td>13</td>
<td>14</td>
<td>67</td>
</tr>
</tbody>
</table>

Regional Office

<table>
<thead>
<tr>
<th>Certificates / Clearances</th>
<th>2015 Issuance</th>
<th>2016 Issuance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Quantity Importation (SQI)</td>
<td>2,865</td>
<td>2,827</td>
</tr>
<tr>
<td>Importation Clearances (Asbestos, Cyanide, Mercury and ODS)</td>
<td>348</td>
<td>320</td>
</tr>
<tr>
<td>Registration Certificates (CCO)</td>
<td>383</td>
<td>617</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,596</td>
<td>3,764</td>
</tr>
</tbody>
</table>
HAZARDOUS WASTE MANAGEMENT

Central Office

A total of nine-hundred seventy-nine (979) registration certificates, notifications and clearances were issued from January to December 2016 with the following breakdown:

<table>
<thead>
<tr>
<th>Certificates / Clearances</th>
<th>2015 Issuance</th>
<th>2016 Issuance</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSD Registration/Renewal/Amendment</td>
<td>134</td>
<td>143</td>
</tr>
<tr>
<td>Transporter Registration/Renewal/Amendment</td>
<td>231</td>
<td>263</td>
</tr>
<tr>
<td>Importation Clearance</td>
<td>187</td>
<td>447</td>
</tr>
<tr>
<td>Notification</td>
<td>49</td>
<td>86</td>
</tr>
<tr>
<td>Export Clearance</td>
<td>34</td>
<td>40</td>
</tr>
<tr>
<td>TOTAL</td>
<td>635</td>
<td>979</td>
</tr>
</tbody>
</table>

Regional Office

At the Regional Offices, a total of eleven thousand twenty nine (11,029) firms including hospitals were issued registration and permits with the following breakdown:

<table>
<thead>
<tr>
<th>Certificates / Clearances</th>
<th>2015 Issuance</th>
<th>2016 Issuance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous Waste Generators (HWGs) Registered</td>
<td>1,363</td>
<td>3,019</td>
</tr>
<tr>
<td>Transport Permit</td>
<td>5,066</td>
<td>8,010</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6,429</td>
<td>11,029</td>
</tr>
</tbody>
</table>
POLLUTION ADJUDICATION BOARD (PAB)

Orders/Resolutions Issued:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CDO</td>
<td>19</td>
</tr>
<tr>
<td>FLO</td>
<td>23</td>
</tr>
<tr>
<td>DISMISSED</td>
<td>17</td>
</tr>
<tr>
<td>TLO</td>
<td>8</td>
</tr>
<tr>
<td>OTHERS</td>
<td>105</td>
</tr>
<tr>
<td>TOTAL</td>
<td>172</td>
</tr>
</tbody>
</table>

In CY 2016, one hundred seventy two (172) PAB Resolutions were issued. Of the total resolutions issued, nineteen (19) firms issued with Cease and Desist Orders (CDO), forty (40) cases were resolved (Final Lifting Order – 23; Dismissed – 17). Other resolutions such as Temporary Lifting Order (TLO), Show Cause Order and others amounted to one hundred thirteen (113) (See Figure 14).

Fines Collected:

The pollution cases lodged before the PAB does not end by merely complying with DENR standards, once found that the firm already complied with the DENR requirement, fines and penalties will be imposed upon the respondent for their previous violations. In line with that, the fines and penalties collected by the PAB from January to December 2016 amounted to Php 29,851,749.99 (See Figure 15).
ENVIRONMENTAL EDUCATION AND INFORMATION

World Water Day (March 2016)

The Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR), through the Environmental Education and Information Division (EEID) organized two events in support of WWD 2016. These are the 60-second Video Contest for college students.

The contest is open to Metro Manila and Regions 3 and 4A. Each entry must focus on the theme, “Water and Jobs.” This year’s theme drew attention to the men and women whose work centers on various sustainable water strategies that satisfy our water needs without putting severe strain to our finite freshwater resources.

The EMB was also part of the 2nd World Water Day Awards, wherein awarded was Bonuan Boquig Elementary School for their water conservation efforts during the awarding ceremony on March 22, 2016 held at Hotel Novotel, Araneta Center, Cubao, Quezon City.

World Water Day (WWD) 60-second Video Contest: Water and Jobs
Earth Day (April 2016)

This year’s theme was “Trees for the Earth. Let’s get Planting. Step up and Deliver, #GreenEnvironmentGawingForever”. Earth Day advocates joined the afternoon celebration dubbed, “Sandiwang (Isang Diwa sa Pagdiriwang ng Kalikasan)” at the Quezon City Memorial Circle grounds. Various exhibits and musical performances formed part of the celebration, along with the annual environmental prayer and chant to save Mother Earth as the main part of the program.

Earth Day Jam

On 23 April 2016, the DENR-EMB in partnership with the Earth Day Jam Foundation held the Earth Day Jam, the longest-running, free concert for the environment on SM by the Bay at SM Mall of Asia, Pasay City. The concert featured 100 local bands and musical artists during the 8-hour long concert attended by more than 5,000 participants.

Philippine Environment Month (June 2016)

In celebration of June as Philippine Environment Month (Theme: Go Wild for Life. Combat Biodiversity Loss, #GreenEnvironmentGawingForever), the Bureau conducted the following activities:
Multi-media exhibit on combating biodiversity loss and beating climate change at Robinsons Galleria in Ortigas Center, Quezon City from June 6 to 8, 2016. Highlight was the special performance of renowned ventriloquist, Ony Carcamo, who entertained mall goers with a comedic performance with an environmental twist.

Environment Bloggers’ Forum with Howie Severino and Noel Cabangon as special guests to promote the hashtag #GreenEnvironmentGawingForever at the Cocoon Boutique Hotel in Quezon City on June 7, 2016.

Annual Clean Air Forum with the Partnership for Clean Air, last June 14 and 15, 2016 at the DENR Social Hall in Quezon City.
Last June 16, 2016, the Bureau conducted a live mural painting (Theme: Combat Biodiversity Loss. Beat Climate Change) by A.G. Saño (painter, marine conservation, and climate advocate) and students in Metro Manila at the Ninoy Aquino Parks and Wildlife Center Amphitheater in Quezon City.

National Clean Air Month (November 2016)

The month of November has been declared as the National Clean Air Month, National Environmental Awareness Month, and National Climate Change Consciousness Week. Because of the important role that everybody plays in promoting a balanced and sustainable environment, as well as an informed citizenry, the theme for the celebration has been dubbed as “Green Schools, Build Climate– resilient and Sustainable Communities.”

As part of the month-long celebration, the EMB organized the 2016 Clean Air Concert, Youth Forum and Exhibit in partnership with the Earth Day Jam Foundation on November 8, 2016 at Market! Market! in Taguig City. Local performers were Silent Sanctuary, Gloc 9 and 6 Cycle Mind. The event was participated in by around 1200 guests and mall goers.
RESEARCH AND LABORATORY SERVICES

A total of two thousand eight hundred seven (2,807) environmental samples were collected and analyzed (inclusive of QA/QC samples) to support the various monitoring activities and projects of the Bureau (i.e. Acid Deposition Monitoring, Air and Water Quality Monitoring, Leachate Monitoring, Beachwatch, adopt-an-Estero, etc.). These samples analyses resulted in twenty thousand seven hundred seventy nine (20,779) determinations for the considered parameters such as BOD, DO, Total and Fecal Coliform, COD, Nutrients, Anions, Cations, Heavy Metals, POPs, etc.

PHILIPPINE ENVIRONMENT PARTNERSHIP PROGRAM (PEPP)

Review and Evaluation of applicants for Track 1 Category

The final evaluation of Track 1 Applicants for 2015 was finished during the 1st Quarter of 2016. All concerned companies, copy furnished the corresponding EMB Regional Offices, were informed of the results of the validation.

Out of twenty-five (25) applicants, twenty-one (21) firms were validated, two (2) firms withdrew their application, and two (2) firms did not qualify in the criteria. Only one (1) firm qualified and was awarded with the DENR Seal of Approval.

As a joint activity with Philippines Chiller Energy Efficiency Project (PCEED), the awarding was conducted last October 12, 2016 at Hotel H2O in Manila. EDC-Green Core
Geothermal Corporation was the sole awardee of the 2015 DENR Seal of Approval. The event was attended by EMB Regional Directors. Assistant Secretary Rommel Abesamis delivered the message in behalf of Secretary Gina Lopez.

Evaluation and Monitoring of Track 2 Category

The PEPP Track 2 Validation of firms endorsed by Regional Offices continued. For CY 2016, twenty-four (24) firms from eight (8) different regions were validated. Four (4) firms submitted their Letter of Intent (LOI) to join PEPP Track 2. Also, the PEPP participated in the conduct of Industry Fora for SMEs in Region 2, 5, 9 and 10 in cooperation with the ECAC.

ENVIRONMENTAL COMPLIANCE ACTION CENTER (ECAC)

This 2016, the Environmental Compliance Assistance Center (ECAC) focused on strengthening its partnership with Micro-Small Medium Enterprises and assisting the Department of Environmental and Natural Resources in promoting their hotline to cater to the environmental issues and concerns raised by stakeholders.

Continuing its thrust in supporting the MSMEs to comply with environmental compliance, ECAC also focused on providing them with the assistance they need in terms of compliance. This was done together with the help of Philippine Environment Partnership Program, Department of Health, and the Development Bank of the Philippines. ECAC also held three Capacity Development Workshop in Environmental
Compliance in NCR together with the help of our regional offices to update MSMEs on the new online permitting of the EMB.

In 2016, there were 795 responses sent coming from the website inquiry alone and 4 campaign and consultations events and 3 workshops conducted all over the country.

It’s a continuing process to help LGUs and MSMEs to assimilate to easier methods for compliance. ECAC also used feedback from the workshop to improve and tailor-fit their services to its audience. Aside from the information and set of efficient guidelines the ECAC provides, workshop output mentioned that ECAC exuded positive reinforcement that helped them understand the mandates of the Environmental Management Bureau and the Department of Environment and Natural Resources. MSMEs also commented that ECAC’s awareness campaign, held of high importance when it came to aiding MSMEs of what they need to know about environmental laws and regulations.

The “Green Advocate” – The ECAC E-Magazine

Green Advocate is the Environmental Compliance Assistance Center’s (ECAC) first e-magazine. Previously conceptualized as a newsletter, the idea of delivering an interactive magazine was born (See Figure 16).

Green Advocate brings a concise summary of EMB news, updates, events, new policies and regulations at the convenience of its compactness. Bring Green Advocate with you everywhere and access them on your phone, iPADs or tablets. You also have the option to subscribe to get the latest issues the moment it drops.

The Bureau associate color green with the feeling of renewal, rebirth, harmony and growth. It is also the first color we pick whenever we think of the environment. As for our center’s advocacy, The Environmental Management Bureau's mission is to protect, restore and enhance environmental quality towards good public health, environmental integrity and economic vitality and in line with this, it is the Environmental Compliance Assistance Center’s goal to assist various sectors of the Philippine industry in their environmental compliance. It is also our goal to influence MSMEs, LGUs, and the education sector to adopt the green advocacy as their social responsibility and to be our partners in the safe-guarding of our environment while we walk the path to a more advanced Philippines.
EBM Hotline

In the latter part of 2016, the EMB Hotline became the support for the DENR Aksyon Kalikasan Hotline to cater to EMB related concerns of stakeholders. In addition to having a dedicated hotline and official email, the EMB also added a supporting landline to cater to other calls. Averaging on 15-20 calls a day, the number of complaints and queries reached a total of **1,688** this year.
VI. ANNEXES

Annex A  Bued WQMA *(DAO 2016-03)*
Annex B  Naga WQMA *(DAO 2016-04)*
Annex C  Coron Bay WQMA *(DAO 2016-05)*
Annex D  Sabang Bay WQMA *(DAO 2016-06)*
Annex E  Water Quality Guidelines and General Effluent Standards *(DAO 2016-05)*
Annex F  Lake Sebu WQMA *(DAO 2016-14)*
Annex G  Ayala River WQMA *(DAO 2016-15)*
Annex H  Tagoloan River WQMA *(DAO 2016-16)*
Annex I  Talomo River WQMA *(DAO 2016-17)*
Annex J  Naguillian WQMA *(DAO 2016-18)*
Annex K  Cañas-Maalimango WQMA *(DAO 2016-19)*
Annex L  Adoption of EURO 4 *(DAO 2016-23)*
Annex M  Providing New Fees and Charges for Various Services of the EMB *(DAO 2016-28)*
Annex N  Additional Classified Waterbodies *(DMC 2016-08)*
Annex O  Requiring Online Submission of CMR under PEISS *(EMB MC 2016-001)*
Annex P  AWQMF Operations Manual *(EMB MC 2016-004)*
Annex P-1  NWQMF Operations Manual *(EMB MC 2016-004)*
Annex Q  ECC Applicants for Mining Projects including Sand and Gravel Quarry Projects *(EMB MC 2016-006)*
Annex R  Clarificatory Guidelines on the Conduct of SET by DENR and its Accredited TPSETF *(EMB MC 2016-008)*
Annex S  Clarification on the Prohibition of Paints with Lead and Lead Compounds used for Children’s Toys and Related Products *(EMB MC 2016-010)*
Annex T  Instructions on the Implementation and Enforcement of the Devolved Functions under DENR MC No. 2002-12 on the CCOs, SQI and PICCs *(EMB MC 2016-011)*
Annex U  Approved Methods of Analysis for Water and Wastewater *(EMB MC 2016-012)*
Annex V  List of Adopted Esteros
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Annex X  Recreational Waters Monitoring *(Water Quality Results)*
Annex Y  List of Approved 10-Year SWM Plan
Annex Y-1  List of Submitted 10-Year SWM Plan
Annex Z  List of MRFs Established
Annex AA  List of Disposal Facilities
Annex AA-1  List of Sanitary Landfill
Annex BB  Foreign Assisted and Special Projects Implemented