



Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Regional Office No. VIII



ENVIRONMENTAL MANAGEMENT BUREAU

RELEASED BY: _____

December 23, 2021

DATE: 12-29-21
TIME: 8:30am

MEMORANDUM

FOR : ENGR. WILLIAM P. CUÑADO
Director
Environmental Management Bureau
DENR Compound, Visayas Avenue
Diliman, Quezon City

Attention : Environmental Quality Division
Water Quality Management Section
Policy, Planning, and Program Development Division

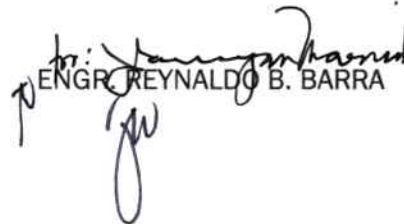
FROM : OIC-Regional Director
EMB Region VIII

SUBJECT : 2021 Second Semester Monitoring Report for Ormoc Bay WQMA

Submitting herewith the CY 2021 Second Monitoring Report for Ormoc Bay Water Quality Management Area (WQMA).

It also presents the monthly water quality monitoring results and the corresponding recommendations addressing the encountered issues for the semester. It entails the status of the operationalization which includes the activities conducted in the 3rd and 4th quarter.

For his information.


ENGR. REYNALDO B. BARRA

SECOND SEMESTER CY 2021 REPORT ORMOC BAY WATER QUALITY MANAGEMENT AREA (WQMA) OPERATIONALIZATION

A. EXECUTIVE SUMMARY

The Ormoc Bay WQMA continued its operationalization for the second semester of CY 2021. The monitoring of the primary parameters was conducted monthly. A Capacity-building on Pollution Load Assessment and Updating of Water Quality Monitoring Policies was conducted last August 26 to 27, 2021, which was participated by the member LGUs' representatives. Moreover, a training workshop and Governing Board meeting of the two WQMAs in the Region was held last October 5 to 7, 2021. In addition, a Year-end Assessment activity was also conducted on December 1 and 2, 2021. Some of the member LGUs also submitted their quarterly accomplishments based on their compliance scheme for this semester.

B. WATER QUALITY MONITORING

1. Data and Results

Table 1. Shows the water quality results of the samples taken from eight river stations last July 2021

Parameters	Date & Time Sampled	Temp, °C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)	BOD (mg/L)
Anilao Upstream	7/29/21; 12:14 PM	30	8.75	7.04	13	1,400	5.00	5.9
Anilao Downstream	7/29/21; 10:30 AM	32.3	8.82	6.47	8	16,000	5	7.3
Malbasag Upstream	7/29/21; 10:26 AM	28.8	8.67	8.87	5	4300	5	5.4
Malbasag Downstream	7/29/21; 10:05 AM	30.1	9.07	5.7	9	16,000	5	6.2
Panilahan River	7/29/21; 9:33 AM	30.10	9.17	5.35	36	16,000	5	6.2
Pagsangahan River	7/29/21; 9:30 AM	31.1	8.72	5.51	29	16,000	10	5.3
Albuera River	7/29/21; 8:53 AM	28.2	8.89	5.15	29	16,000	5	6.1
Merida River	7/29/21; 9:27 AM	31.4	8.3	*	25	16,000	5	5.9
DENR Standard (Class SC)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75	7 (max)

Table 2. Shows the water quality results of the samples taken from six coastal last July 2021

Parameters	Date & Time Sampled	Temperature, °C	pH	DO, mg/L	TSS (mg/L)	True Color (CU)	Fecal Coliform Concentration (MPN/100mL)
Albuera	7/29/21; 9:06 AM	30.3	8.47	*	119	5	16,000
Don Felipe	7/29/21; 9:20 AM	31.7	8.25	*	116	5	16,000
Filmag	7/29/21; 10:02 AM	32	8.12	*	163	5	78
Merida	7/29/21; 9:15 AM	31	7.67	*	296	5	16,000
Bantigue	7/29/21; 9:50 AM	30.3	8.4	5.3	91	5	16,000
YMCA	7/29/21; 10:05 AM	31.3	8.03	*	211	10	1,700
DENR Standard (Class C)	-	25.00 -31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	75	200.00 (max)

Table 3. Shows the water quality results of the samples taken from eight river stations last August 2021

Parameters	Date & Time Sampled	Temp, °C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)	BOD (mg/L)
Anilao Upstream	08/18/21; 11:25 AM	26	8.2	9.15	3	*	5	3.2
Anilao Downstream	08/18/21; 10:10 AM	30.2	8.15	8.02	31	*	5	3.5
Malbasag Upstream	08/18/21; 9:52AM	27.3	8.37	10.74	3	*	5	2.6
Malbasag Downstream	08/18/21; 9:39 AM	28.9	8.74	9.39	11	*	5	3.5
Panilahan River	08/18/21; 9:06AM	29.40	8.55	7.55	124	*	5	3.5
Pagsanga-hn River	08/18/21; 10:08 AM	31.9	7.29	7.29	53	*	5	6.7
Albuera River	08/18/21; 8:41 AM	28.4	8.26	8.26	6	*	5	3.1
Merida River	08/18/21; 9:27 AM	33.5	7.56	9.32	50	*	5	2.9
DENR Standard (Class SC)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75	7 (max)

Table 4. Shows the water quality results of the samples taken from six coastal stations last August 2021

Parameters	Date & Time Sampled	Temperature, °C	pH	DO, mg/L	TSS (mg/L)	True Color (CU)	Fecal Coliform Concentration (MPN/100mL)
Albuera	08/18/21; 8:52AM	30.6	8.26	8.03	77	5	*
Don Felipe	08/18/21; 9:29 AM	32.2	7.58	9.2	37	5	*
Filmag	08/18/21; 10:00 AM	32.2	9.66	9.44	87	5	*
Merida	08/18/21; 8:40 AM	31	7.79	9.44	46	5	*
Bantigue	08/18/21; 9:25:AM	30.9	8.22	9.2	75	5	*
YMCA	08/18/21; 9:10 AM	34	7.29	8.36	53	5	*
DENR Standard (Class C)	-	25.00 -31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	75	200.00 (max)

Table 5. Shows the water quality results of the samples taken from eight river stations last September 2021

Parameters	Date & time of sampling	Temp, °C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)	BOD (mg/L)
Anilao Upstream	9/15/21; 11:11AM	26	7.41	6.88	34	3500	5	3.2
Anilao Downstream	9/15/21; 9:59AM	30	7.72	7.12	6	>16000	5	5
Malbasag Upstream	9/15/21; 9:45AM	27.5	7.71	6.24	27	2200	5	3.5
Malbasag Downstream	9/15/21; 9:25AM	29	7.46	6.48	8	>16000	5	6.6
Panilahan River	9/15/21; 8:44AM	27.60	7.49	6.17	664	490	5	5.4
Pagsangahan River	9/15/21; 10:08AM	30.5	6.07	5.63	106	>16000	5	5
Albuera River	9/15/21; 8:20 AM	30.7	7.23	6.15	4	>16000	5	3.8
Merida River	9/15/21; 9:21AM	31	6.44	5.75	47	>16000	5	3.1
DENR Standard (Class SC)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75	7 (max)

Table 4. Shows the water quality results of the samples taken from six coastal stations last August 2021

Parameters	Date & Time Sampled	Temperature, °C	pH	DO, mg/L	TSS (mg/L)	True Color (CU)	Fecal Coliform Concentration (MPN/100mL)
Albuera	08/18/21; 8:52AM	30.6	8.26	8.03	77	5	*
Don Felipe	08/18/21; 9:29 AM	32.2	7.58	9.2	37	5	*
Filmag	08/18/21; 10:00 AM	32.2	9.66	9.44	87	5	*
Merida	08/18/21; 8:40 AM	31	7.79	9.44	46	5	*
Bantigue	08/18/21; 9:25:AM	30.9	8.22	9.2	75	5	*
YMCA	08/18/21; 9:10 AM	34	7.29	8.36	53	5	*
DENR Standard (Class C)	-	25.00 -31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	75	200.00 (max)

Table 5. Shows the water quality results of the samples taken from eight river stations last September 2021

Parameters	Date & time of sampling	Temp, °C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)	BOD (mg/L)
Anilao Upstream	9/15/21; 11:11AM	26	7.41	6.88	34	3500	5	3.2
Anilao Downstream	9/15/21; 9:59AM	30	7.72	7.12	6	>16000	5	5
Malbasag Upstream	9/15/21; 9:45AM	27.5	7.71	6.24	27	2200	5	3.5
Malbasag Downstream	9/15/21; 9:25AM	29	7.46	6.48	8	>16000	5	6.6
Panilahan River	9/15/21; 8:44AM	27.60	7.49	6.17	664	490	5	5.4
Pagsangahan River	9/15/21; 10:08AM	30.5	6.07	5.63	106	>16000	5	5
Albuera River	9/15/21; 8:20 AM	30.7	7.23	6.15	4	>16000	5	3.8
Merida River	9/15/21; 9:21AM	31	6.44	5.75	47	>16000	5	3.1
DENR Standard (Class SC)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75	7 (max)

Table 6. Shows the water quality results of the samples taken from six coastal last September 2021

Parameters	Time Sampled	Temp, °C	pH	DO, mg/L	TSS mg/L	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)
Albuera	9/15/21; 8:35AM	30.2	7.51	5.6	11	2400.00	5
Don Felipe	9/15/21; 10:25AM	31.3	7.13	5.2	26	16000.00	5
Filmag	9/15/21; 9:45AM	29.7	6.85	5.88	47	1300.00	5
Merida	9/15/21; 9:12AM	28.6	7.06	5.32	69	9200.00	5
Bantigue	9/15/21; 9:06AM	30.8	7.47	6.38	102	330.00	5
YMCA	9/15/21; 10:40AM	30.9	6.59	5.72	74	16000.00	5
DENR Standard (Class C)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75

Table 7. Shows the water quality results of the samples taken from eight river stations last October 2021

Parameters	Time Sampled	Temp, °C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	BOD (mg/L)
Anilao Upstream	9/15/21; 11:11AM	31	7.49	5.21	nd	460	3.6
Anilao Downstream	9/15/21; 9:59AM	30.4	7.12	3.84	8	*	7.4
Malbasag Upstream	9/15/21; 9:45AM	31	7.87	7.22	7	*	4
Malbasag Downstream	9/15/21; 9:25AM	31.3	7.97	4.66	36	*	7.4
Panilahan River	9/15/21; 8:44AM	30.3	7.16	4.56	448	5400	3.5
Pagsangahan River	9/15/21; 10:08AM	28.2	8.13	6.11	79	9200	4
Albuera River	9/15/21; 8:20 AM	27.9	7.56	6.25	144	16000	5.9
Merida River	9/15/21; 9:21AM	28	7.79	6.67	66	9200	3.5
DENR Standard (Class SC)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75

Table 8. Shows the water quality results of the samples taken from six coastal stations last October 2021

Parameters	Date & Time Sampled	Temperature, ° C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)
Albuera	10/13/21; 9:40 AM	30.3	7.5	5.63	89	790	5
Don Felipe	10/13/21; 11:00 AM	31.04	7.46	6.76	72	16000	5
Filmag	10/13/21; 9:45 AM	32	8.2	7.8	373	1100	5
Merida	10/13/21; 9:00 AM	30.1	7.64	7.68	76	330	5
Bantigue	10/13/21; 10:05 AM	30.1	7.45	4.95	214	*	5
YMCA	10/13/21; 10:36 AM	30.06	8.13	6.12	143	3500	5
DENR Standard (Class C)	-	25.00 -31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75

Table 9. Shows the water quality results of the samples taken from eight river stations last November 2021

Parameters	Date & Time Sampled	Temp, ° C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)	BOD (mg/L)
Anilao Upstream	11/16/21; 12:01 PM	29	6.9	12.01	7.21	1300	5	1.3
Anilao Downstream	11/16/21; 1:18 PM	27.9	7.56	7.21	7.15	16001	5	3.4
Malbasag Upstream	11/16/21; 9:12 AM	27.6	7.71	7.08	0	1300	5	1.5
Malbasag Downstream	11/16/21; 9:18 AM	28.3	7.46	7.06	6	9200	5	1.9
Panilahan River	11/16/21 10:58 AM	30.10	6.52	7.15	1340	9200	5	7.6
Pagsangahan River	11/16/2021 10:13:00	31.1	8.72	6.53	81	16001	5	1.3
Albuera River	11/16/21 10:09 AM	29.1	8.2	7.1	18	16001	5	2
Merida River	11/16/21 10:13 AM	30.3	7.4	6.37	72	5400	5	2.2
DENR Standard (Class SC)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75	7(max)

Table 10. Shows the water quality results of the samples taken from six coastal stations last November 2021

Parameter s	Time Sampled	Temp ° C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)
Albuera	11/16/21 10:25 AM	29.2	6.2	7.01	7.01	1700	5
Don Felipe	11/16/21 10:45 AM	31.04	7.64	6.89	6.89	16001	5
Filmag	11/16/21 11:20 AM	32	7.45	6.4	6.4	5400	5
Merida	11/16/21 9:20 AM	30.1	8.13	6.41	6.41	790	5
Bantigue	11/16/21 11:25 AM	30.4	6.94	7.15	7.15	3500	15
YMCA	11/16/21 11:39 AM	30.6	7.7	6.89	6.89	9200	5
DENR Standard (Class C)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75

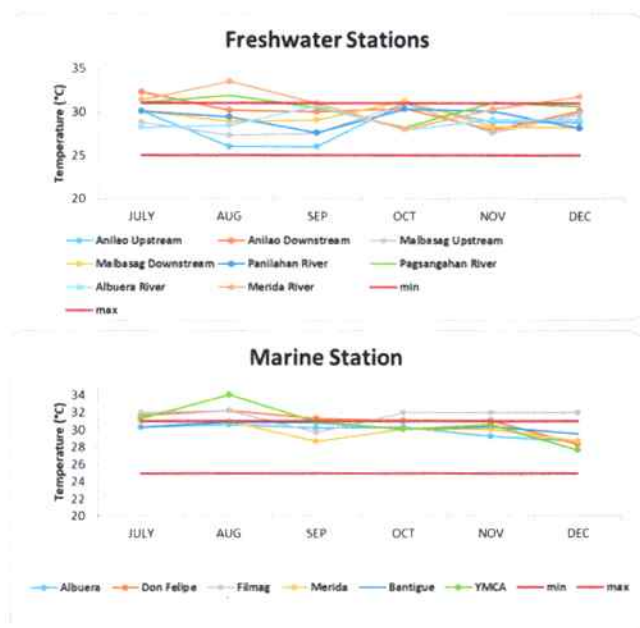
Table 11. Shows the water quality results of the samples taken from eight river stations last December 2021

Parameters	Date & Time Sampled	Temp, ° C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)	BOD (mg/L)
Anilao Upstream	12/14/21; 2:04 PM	28.8	7.6	7.6	7.6	5400	5	*
Anilao Downstream	12/14/21; 11:55 AM	30.1	6.72	6.72	6.72	16000	5	*
Malbasag Upstream	12/14/21; 11:39 AM	29.8	7.48	7.48	7.48	5400	5	*
Malbasag Downstream	12/14/21; 12:39 PM	28.2	6.37	6.37	6.37	16000	5	*
Panilahan River	12/14/21; 11:02 AM	28.1	7.3	7.3	7.3	2400	10	*
Pagsangahan River	12/14/21; 11:46 AM	30.6	6.5	6.5	6.5	16000	5	*
Albuera River	12/14/21; 10:40 AM	29.1	7.45	7.45	7.45	16000	20	*
Merida River	12/14/21; 11:05 AM	31.8	6.35	6.35	6.35	16001	5	*
DENR Standard (Class SC)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75	7(max)

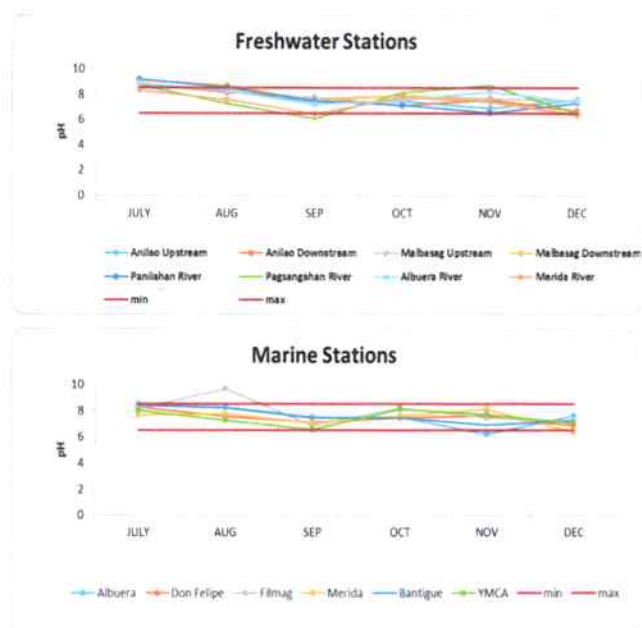
Table 12. Shows the water quality results of the samples taken from eight river stations last December 2021

Parameters	Time Sampled	Temp ° C	pH	DO, mg/L	TSS (mg/L)	Fecal Coliform Concentration (MPN/100mL)	True Color (CU)
Albuera	12/14/21; 10:25 AM	28.7	28.7	5.85	17	790	5
Don Felipe	12/14/21; 12:26 PM	28.3	28.3	9.26	21	5400	5
Filmag	12/14/21; 11:21 AM	32	32	9.03	234	2300	5
Merida	12/14/21; 10:43 AM	28.7	28.7	8.87	21	2200	5
Bantigue	12/14/21; 11:18 AM	29.5	29.5	8.97	13	230	15
YMCA	12/14/21; 12:10 AM	27.6	27.6	5.91	47	16001	5
DENR Standard (Class C)	-	25.00 - 31.00	6.50 - 8.50	5.00 (min)	80.00 (max)	200.00 (max)	75

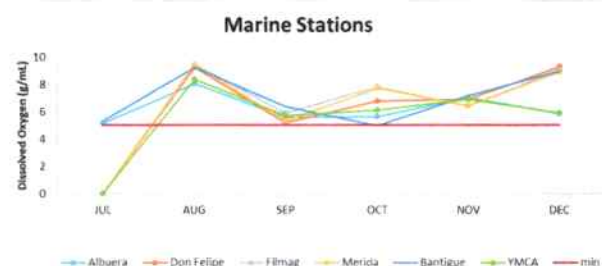
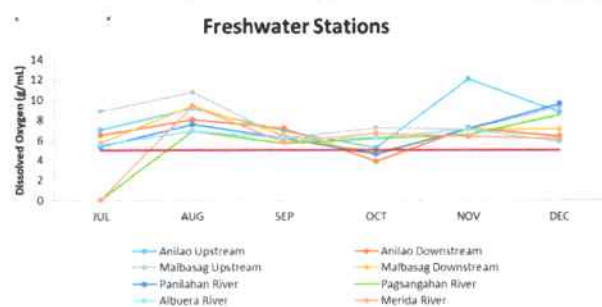
2. Graphical Presentation of the parameters measured during the Monitoring and Sampling for July to December 2021



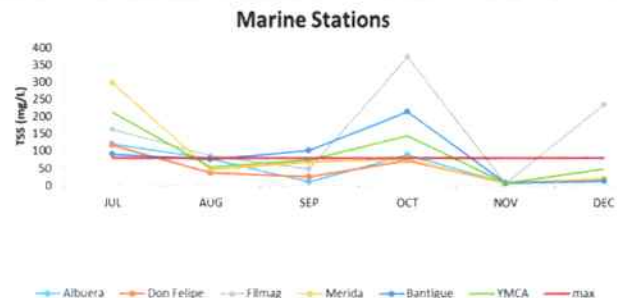
Graph 1. Bar graph showing the water temperature result of each river and coastal sampling station during 2nd Semester 2021



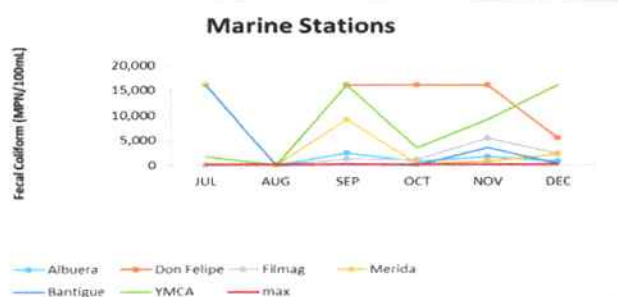
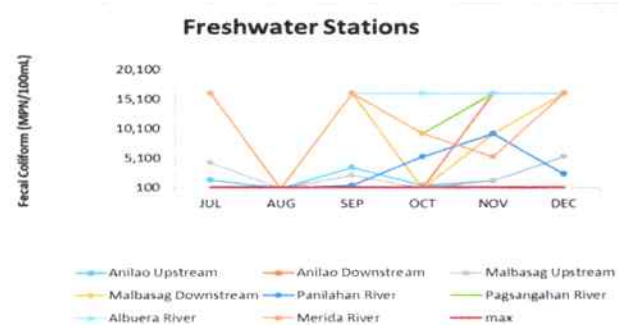
Graph 2. Bar graph showing the water pH result of each river and coastal sampling station during 2nd Semester 2021



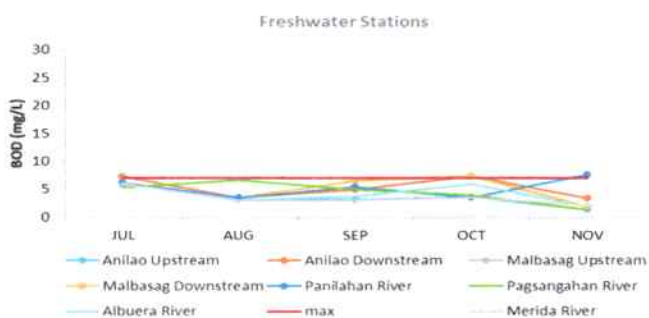
Graph 3. Bar graph showing the water DO result of each river and coastal sampling station 2nd Semester 2021



Graph 4. Bar graph showing the water TSS result of each river and coastal sampling station 2nd Semester 2021



Graph 5. Bar graph showing the water fecal coliform result of each river and coastal sampling station 2nd Semester 2021



Graph 6. Bar graph showing the water BOD result of each river sampling station during 1st Semester 2021

Most stations' Temperature, DO, and pH are within the standard water quality guidelines throughout the semester. However, some stations manifested a below-minimum measure of DO—Anilao River (downstream) and Panilahan River in October. Moreover, some stations showed slight increase in temperature and pH. As presented in the tables and graphs above, TSS values for most coastal stations were above standard for July and October. This may have been caused by the strong current that disturbed the sediments.

Since heavy metals samples are still analyzed in Cebu, no samples were collected due to unavoidable shipping delays brought by COVID 19.

For fecal coliform parameter, unfortunately, all stations exceeded the maximum allowable limit of 200 MPN/100ml. This is mostly attributed to the direct discharge of untreated wastewater coming from households and commercial establishments into the waterbodies.

C. Capacity Building on Pollution Load Assessment and Updating of Water Quality Monitoring Policies

On August 26 to 27, 2021, a capacity-building program on Pollution Load Assessment and updating of Water Quality Monitoring policies was conducted and participated by LGU representatives. A resource speaker from the DILG was invited to discuss the Mandanas Ruling. Rudith A. Roca of the Department of the Interior and Local Government (DILG) Region 8 was invited over to walk the participants through the projected local government's internal revenue allotment (IRA) as LGUs assume more functions including environmental services starting 2022.

D. Training Workshop on the Preparation/Updating of LGU Compliance Scheme based on the 10 Year WQMA Action Plan, Basic GIS Training, Pollution Load Assessment / Joint WQMA GB Meeting

For the third quarter GB meeting, the activity was finally held in a physical environment. To maximize the time of the participants and technical staff organizing the event, a training workshop was also incorporated into the program. Along with the agendas related to the operationalization of WQMA, a training workshop was also conducted to strengthen the capacity of the LGU representatives. The training included the Preparation/Updating of the LGU Compliance Scheme based on the 10 Year WQMA Action Plan, Basic GIS, and Pollution Load Assessment. The training was participated by LGU representatives and members of the governing board. Moreover, Basic GIS training was also added to the activity considering its significance as a helpful environmental monitoring and management tool. The training also served as a preparation for the LGUs for when the Mandanas Ruling fully takes effect and most parts of the operationalization of the WQMA are devolved to the LGUs. Most of the LGU representatives who participated asked for more training activities and more in-depth GIS training. Although as brought up in the GB meeting, the lack of continuity in the MENRO position in some LGUs should be considered before investing in more capacity-building activities.

E. CY 2021 Year End Assessment of Ormoc Bay and Dupong, Matlang, Merida WQMA

For the fourth quarter GB meeting, a Year-end Assessment of the WQMAs in region—Ormoc Bay WQMA and Dupong, Matlang, and Merida WQMA was conducted and participated by LGU representatives and other members of the governing board. The activity

was held on December 1 and 2. The activity included a presentation/discussion of the 3rd Quarter of Ormoc Bay WQMA, Dupont, Matlang, and Merida WQMA, and Adopt an Estero/ Waterbody inside WQMA, submission of the 4th Quarter CY 2021 Accomplishment Reports based on the members' LGU Compliance Scheme, and presentation by the member LGUs' respective implementation of their Compliance Schemes.


F. ISSUES AND RECOMMENDATIONS

1. For the member LGUs to continue the environmental programs included in their respective compliance schemes consistent with the goals of the WQMA Action Plan especially in the abatement of direct discharge of untreated wastewater into the waterbodies.
2. For the member LGUs to regularly submit their quarterly accomplishment reports
3. There should be an effort to address the lack of continuity in some of the LGUs' MENR offices and MENRO positions as a result of changing the personnel as the mayoral administration changes
4. As raised by LGU Ormoc, the City Health Office should be included in WQMA meetings to solicit their inputs in addressing the fecal coliform concentration issues
5. Member LGUs should conduct an investigation in regards to the causes of high Fecal Coliform concentration and present a graphical presentation of all the parameter results since the commencement of WQMA up to the most recent and present it in the GB meeting

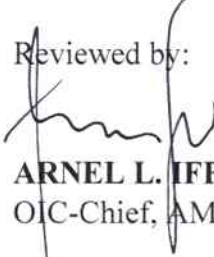
Prepared by:


KAREN PATRICIA A. FABILE
Senior EMS

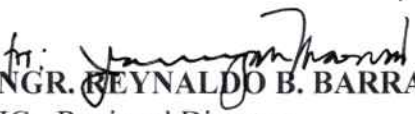
Approved by:


MANUEL J. SACEDA, JR.
OIC-Chief, EMED

Reviewed by:


ARNEL L. IFE
OIC-Chief, AMS

Noted:


ENGR. REYNALDO B. BARRA
OIC - Regional Director