

Current status of preparing metadata at EANET sites

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Metadata will be prepared by using National Monitoring Plan (NMP) submitted from each EANET member countries

- Preparation and submission of NMP
 - First summarization of the NMP was prepared in November 2001.
 - NMP is required to be submitted when the participating country submit its monitoring data to the Network Center (NC) usually at the end of every June.
 - When the participating country make some revision, the revised NMP shall be submitted to the NC as soon as possible.

Template of National Monitoring Plan (1)

(Outline of the national monitoring plan (Monitoring items, person in charge, contact address))

1. Outline of the national monitoring plan

1) Overview of the implementation body

Created date of the plan	
Country	Malaysia
Responsible organization	Malaysian Meteorological Department
Department	Environmental Studies Division
Person in charge	Maznorizan Mohamad
Postal address	Malaysian Meteorological Department Jalan Sultan, 46667 Petaling Jaya, Selangor, Malaysia
Contact information	Telephone: +603-7967 8067 Facsimile: +603-7957 8046 E-mail address: maz@met.gov.my

2) Number of monitoring sites

Items	Planned monitoring sites			Monitoring site in the future		
	Urban	Rural	Remote	Urban	Rural	Remote
Wet deposition	2	1	1			
Air concentration (Dry deposition)	1	1	1	1		
Soil and vegetation	1					
Inland aquatic environment	1		1			
Catchment-scale survey						

3) Overview of measurement parameters and monitoring interval

Items	Measurement parameters	Monitoring interval
Wet deposition	1: pH, 2: EC, 3: NH_4^+ , 4: Na^+ , 5: K^+ , 6: Ca^{2+} , 7: Mg^{2+} , 8: SO_4^{2-} , 9: NO_3^- , 10: Cl^- , 11: other (CH_3COO^- , HCOO^- , $\text{C}_2\text{O}_4^{2-}$)	1: daily 2: other (weekly)
Air concentration (Dry deposition)	1: SO_2 , 2: NO_2 , 3: NH_3 , 4: O_3 , 5: other gases (HNO_3 , NH_3 , HCl), 6: particulate matter (PM), 7: components in PM	1: hourly 2: other (weekly/bi-weekly)
Soil	1: pH(H_2O), 2: pH(KCl), exchangeable (3: Na^+ , 4: K^+ , 5: Ca^{2+} , 6: Mg^{2+} , 7: Al^{3+} , 8: H^+), 9: exchangeable acidity, 10: SO_4^{2-} , 11: other (bulk density and moisture content)	Monitoring period (month: Every 3 months, year: _____)
Vegetation	1: observation of tree decline, 2: description of trees, 3: other (_____)	
Inland aquatic environment	1: water temperature, 2: pH, 3: EC, 4: alkalinity, 5: NH_4^+ , 6: Na^+ , 7: K^+ , 8: Ca^{2+} , 9: Mg^{2+} , 10: SO_4^{2-} , 11: NO_3^- , 12: Cl^- , 13: other (_____), 14: transparency, 15: water colour, 16: DOC(COD), 17: _____, 18: _____, 19: sediment (SO_4^{2-} , NO_3^- , and NH_4^+ in pore water), 20: others (_____, _____, _____)	1: regularly (4 times/year) 2: irregularly (month: _____, year: _____)

4) Participating laboratories for each monitoring activity

Wet deposition / air concentration (dry deposition)			
Organisation	Department Of Chemistry	Code	MY01
Person in charge in the laboratory	Haslina Abdullah		
Postal address	Department Of Chemistry Jalan Sultan, 46661 Petaling Jaya, Selangor, Malaysia		
Contact information	Telephone: 603 – 7985 3111 Facsimile: 603 – 7955 6764 E-mail address: haslina@kimia.gov.my		
Note	Petaling Jaya, Cameron Highlands, Danum Valley, Kuching		

Soil and vegetation			
Organisation	Universiti Putra Malaysia	Code	MY04
Person in charge in the laboratory	Mohamad Hilmi bin Ibrahim		
Postal address	Department of Crop Science, Faculty of Agriculture and Food Science, Universiti Putra Malaysia Bintulu Campus, 97008, Bintulu, Sarawak, Malaysia		
Contact information	Telephone: +6014-8961294 Facsimile: E-mail address: mohamadhilmiibrahim@gmail.com		
Note	Universiti Putra Malaysia Rehabilitated Forest		

Inland aquatic environment			
Organisation	Department Of Chemistry	Code	MY01
Person in charge in the laboratory	Haslina Abdullah		
Postal address	Department Of Chemistry Jalan Sultan, 46661 Petaling Jaya, Selangor, Malaysia		
Contact information	Telephone: 603 – 7985 3111 Facsimile: 603 – 7955 6764 E-mail address: haslina@kimia.gov.my		
Note	Tembaling River, Semenyih Dam (anion, kation)		

Template of National Monitoring Plan (2)

(Detailed information on monitoring items)

4) Overview of measurement parameters and monitoring interval for wet deposition monitoring

[Form-05]

Items	Measurement parameters	Monitoring interval
Wet deposition	[Mandatory items] <ul style="list-style-type: none"> ➢ pH ➢ Electric conductivity (EC) ➢ Concentration of cations (NH_4^+, Na^+, K^+, Ca^{2+}, Mg^{2+}) ➢ Concentration of Anions (SO_4^{2-}, NO_3^-, Cl^-) <i>If there might be some additional items for the monitoring, every monitoring item should be described below:</i> <ul style="list-style-type: none"> ➢ HCO_3^-, NO_2^-, F^-, Br^-, PO_4^{3-} ➢ Organic ions (HCOO^-, CH_3COO^-, $(\text{COO}^-)_2$) 	1: daily 2: composited weekly 3: event basis
	<Meteorological measurements> <ul style="list-style-type: none"> ➢ Wind direction and velocity ➢ Temperature ➢ Relative humidity ➢ Precipitation amount ➢ Solar radiation ➢ Meteorological data acquired from the nearest meteorological observation station 	

5) Overview of measurement parameters and monitoring interval for air concentration monitoring

[Form-06]

Items	Measurement parameters	Monitoring interval
Air concentration (Dry deposition)	<Filter pack sampling> <ul style="list-style-type: none"> ➢ SO_2 concentration converted from SO_4^{2-} concentration ➢ NO_2 concentration converted from NO_3^- concentration ➢ HCl concentration converted from Cl^- concentration ➢ NH_3 concentration converted from NH_4^+ concentration ➢ Na^+, K^+, Ca^{2+}, Mg^{2+} 	1: weekly 2: bi-weekly 3: daily
	<Passive sampling> <ul style="list-style-type: none"> ➢ SO_2 concentration converted from SO_4^{2-} concentration ➢ O_3 concentration converted from NO_3^- concentration ➢ NH_3 concentration converted from NO_2^- concentration ➢ NO_2 concentration converted from NO_2^- concentration ➢ NO_x concentration converted from NO_2^- concentration 	1: one week 2: two weeks 3: three weeks 4: one month
	<Annular denuder> <ul style="list-style-type: none"> ➢ Concentration of N as HNO_3 ➢ Concentration of S as SO_2 ➢ Concentration of N as NH_3 	1: weekly 2: bi-weekly
	<Automatic Monitor> <ul style="list-style-type: none"> ➢ SO_2, NO_x, O_3 and PM 	➢ Every one minute

6) Overview of measurement parameters and monitoring interval for Soil and vegetation monitoring

[Form-07]

Items	Measurement parameters	Monitoring interval
Soil	[Mandatory items for chemical properties] <ul style="list-style-type: none"> ➢ Moisture content ➢ $\text{pH}(\text{H}_2\text{O})$ and $\text{pH}(\text{KCl})$ ➢ Exchangeable base cations (Na^+, K^+, Ca^{2+}, Mg^{2+}) ➢ Exchangeable acidity ➢ Effective cation exchangeable capacity (ECEC) ➢ Carbonate content (when $\text{pH}(\text{H}_2\text{O}) > 7$) [Optional items for chemical properties] <ul style="list-style-type: none"> ➢ Exchangeable cations (Al^{3+}, H^+) ➢ Carbonate content (when $\text{pH}(\text{H}_2\text{O})$ is less than or equal to 7) ➢ Total carbon content ➢ Total nitrogen content ➢ Available PO_4^{3-} ➢ SO_4^{2-} [Optional items for physical properties] <ul style="list-style-type: none"> ➢ Fine earth bulk density ➢ Penetration resistance in the fieldwork 	➢ Once in every 3 to 5 years
Forest monitoring	[Mandatory items] <ul style="list-style-type: none"> <General description of the forest> ➢ Description of the tree (name of species, diameter at breast height and height of tree) ➢ Understory vegetation survey <Survey of tree decline> ➢ Observation of tree decline [Optional items] <ul style="list-style-type: none"> <Survey of tree decline> ➢ Photographic record of tree decline ➢ Estimation of decline causes 	<General description of the forest> ➢ Once in every 3 to 5 years <Survey of tree decline> [Mandatory items] ➢ Once in a year [Optional items] ➢ Once in every 3 to 5 years
Intensive survey	[Optional items] <ul style="list-style-type: none"> <Rain> ➢ Acidity (pH) ➢ Electric conductivity (EC) ➢ Cations (Na^+, K^+, Ca^{2+}, Mg^{2+} and NH_4^+) ➢ Anions (NO_2^-, NO_3^-, SO_4^{2-}, Cl^- and PO_4^{3-}) <Throughfall> ➢ Acidity (pH) ➢ Electric conductivity (EC) ➢ Cations (Na^+, K^+, Ca^{2+}, Mg^{2+} and NH_4^+) ➢ Anions (NO_2^-, NO_3^-, SO_4^{2-}, Cl^- and PO_4^{3-}) <Stemflow> ➢ Acidity (pH) ➢ Electric conductivity (EC) ➢ Cations (Na^+, K^+, Ca^{2+}, Mg^{2+} and NH_4^+) ➢ Anions (NO_2^-, NO_3^-, SO_4^{2-}, Cl^- and PO_4^{3-}) 	➢ Weekly collection (preferable) ➢ Biweekly collection (acceptable)

Template of National Monitoring Plan (3)

(Detailed information on monitoring sites)

1. Monitoring site

1) Outline of monitoring site of acid deposition related species concentration in precipitation

[Form-11]

Site name		Code	
Address			
Site classification	1: urban	2: rural	3: remote
Latitude	° ' " N S	Longitude	° ' " E
Height from sea level	m		

2) Outline of monitoring site of atmospheric acid deposition related species concentration [Form-12]

Site name		Code	
Address			
Site classification	1: urban	2: rural	3: remote
Latitude	° ' " N S	Longitude	° ' " E
Height from sea level	m		

3) Additional information for soil and vegetation monitoring [Form-13]

Site name	
Data of wet deposition	1: on site measuring data 2: use the nearest wet deposition monitoring site data
In case of use the nearest wet deposition monitoring site data	Name of the site: distance from the site: km direction from the site (bearings):
Site classification of the wet deposition monitoring site	1: urban 2: rural 3: remote

4) Site properties for inland aquatic environment monitoring (research year) [Form-14]

Kind	1. Lake	2. River (stream)	3. Other ()
Origin (for lakes/ponds)			
Nearest Wet deposition monitoring site	(km)		
Living organisms			
Catchment Area	km ² (based on the sampling site)		
Catchment elevation and topography	m~ m		
Surface geology			
Soil types			
Vegetation			
Land use			
Population			
Lake area	m ²	Lake shape	
Shore line length	m		
Lake trophic type			
Water depth(mean)	m	(maximum)	m
Water volume	m ³		
Annual water level fluctuation	m ~ m (mean m)		
Residence time of water			
Lake utilization			
Number of inflow river		Number of outflow river	
River length			
River water depth (mean)	m	Minimum & maximum	m
Flow discharge (m ³ sec ⁻¹)	Mean:	Minimum:	Maximum
Drought or freeze	1. Nothing 2. Existence(~)		
Lake or river (flows into)			
Precipitation (mm)	Annual and monthly data		
Evaporation (mm)	At least annual		
Solar radiation		Wind speed	mean
Prevailing Wind direction		Annual air temperature	
Relative humidity			
Nearest meteorological station			
Soil chemical properties in the catchment area			
Bottom sediment			

Template of National Monitoring Plan (3)

(Information on surrounding of monitoring sites)

4) Outline of monitoring site: On-site scale (distance within 150 m)

Items	North direction (NW – NE)	East direction (NE – SE)	South direction (SE – SW)	West direction (SW – NW)
Existence of trees, poles and buildings, and the height of those	Trees with 7-8 m height	Trees with 7-8 m height	Trees with 7-8 m height	Pole of meteorological observation exists for a distance of 3m.
Existence of incinerators, domestic heating, parking lots, storage of fuel and agricultural products, daily farm, and many livestock	Non	Non	Parabola antenna of astronomy observation exists for a distance of 100m.	Non
Slope degree of the site	0° – 10°	0° – 10°	0° – 10°	0° – 10°
Surface condition of the site	Glass	Glass	Glass	Glass
Existence of a forest, river, lake, marsh, farm or fields	Forest	Forest	Forest	Forest
Existence of roads and their traffic densities*	A road with 6m width Traffic is small even in sightseeing season (May-October).	A road with 6m width Traffic is small even in sightseeing season (May-October).	Non	Non

* Describe roads with more than 100 vehicles/day for remote sites and roads with more than 1,000 vehicles/day for urban and rural sites.

Template of National Monitoring Plan (4)

(Detailed information on monitoring instruments)

6. Outline of analytical methodologies

1) Adopted analytical method for wet deposition monitoring

Name of monitoring laboratory Japan Environmental Sanitation Center, East Branch Office, Environmental Science Dept.		
Monitoring item	Adopted analytical method	Manufacturer and type of the instrument Upper: manufacturer Lower: type
Mandatory		
pH	1: Glass electrode, 2: other ()	TOA-DKK, HM-30R
EC	1: Conductivity cell, 2: other ()	TOA-DKK, CM-30R
SO ₄ ²⁻	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Spectrometry (a: BaCrO ₄ , b: BaCrO ₄ -Carbazide, c: other), 3: other ()	DIONEX ICS-2000
NO ₃ ⁻	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Spectrometry (a: Cadmium reduction, b: other), 3: other ()	DIONEX ICS-2000
Cl ⁻	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Spectrometry (a: Mercury (II) thiocyanate, b: other), 3: other ()	DIONEX ICS-2000
NH ₄ ⁺	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Spectrometry (a: Indophenol blue, b: Nessler's reagent, c: other), 3: other ()	DIONEX ICS-1500
Na ⁺	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Atomic absorption spectrometry, 3: Emission spectrometry, 4: other ()	DIONEX ICS-1500
K ⁺	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Atomic absorption spectrometry, 3: Emission spectrometry, 4: other ()	DIONEX ICS-1500
Ca ²⁺	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Atomic absorption spectrometry, 3: Emission spectrometry, 4: other ()	DIONEX ICS-1500
Mg ²⁺	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Atomic absorption spectrometry, 3: Emission spectrometry, 4: other ()	DIONEX ICS-1500

2) Adopted analytical method for wet deposition monitoring

Name of monitoring laboratory Japan Environmental Sanitation Center, East Branch Office, Environmental Science Dept.		
Monitoring item	Adopted analytical method	Manufacturer and type of the instrument Upper: manufacturer Lower: type
Optional		
F ⁻	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: other ()	DIONEX ICS-2000
HCO ₃ ⁻	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: other ()	DIONEX ICS-2000
R-COO ⁻	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: other ()	DIONEX ICS-2000
NO ₂ ⁻	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Spectrometry (a: Naphthyl ethylenediamin, b: other), 3: other ()	DIONEX ICS-2000
PO ₄ ⁻	1: Ion chromatography (a: with suppressor, b: no suppressor), 2: Spectrometry (a: Molybdenum blue, b: other), 3: other ()	DIONEX ICS-2000

3) Adopted analytical method of automatic system for air concentration monitoring

Name of monitoring laboratory Japan Environmental Sanitation Center, East Branch Office, Environmental Science Dept.		
Monitoring item	Adopted analytical method	Manufacturer and type of the instrument Upper: manufacturer Lower: type
SO ₂	1: Ultraviolet fluorometry, 2: H ₂ O ₂ oxidation/Electric conductivity 3: other ()	HORIBA APSA-365
NO ₂	1: Chemiluminescence, 2: Spectrometry with Salzmann reagent 3: other ()	HORIBA APNA-365
NO	1: Chemiluminescence, 2: Spectrometry with Salzmann reagent 3: other ()	HORIBA APNA-365
O ₃	1: Ultraviolet absorption spectrometry, 2: Spectrometry with neutral potassium iodide, 3: other ()	HORIBA APOA-370

Two options how to transfer metadata to WIGOS

(Proposed by WMO)

1. Producing xml file and incorporate to the OSCAR system
 - We prepared the sample xml file for Tappi station in Japan.
 - Send xml file to confirm if it works well.
 - We will prepare metadata for other stations but it takes some times because some manual works are necessary.
2. Log into OSCAR focal point account and input the metadata manually
 - This option is more easy to operate by all our staffs.
 - I would like to choose two options in parallel and transfer EANET metadata as early as possible.