2. AIR QUALITY

2.1 Monitoring Requirements

As stated in the EM&A Manual, the baseline air quality monitoring has been conducted in the first quarter of 2000 to determine the action levels for 1-hour TSP and 24-hour TSP. 24-hour TSP values were collected at the existing three dust monitoring stations from January to March 2000. Sampling of 1-hour TSP was also carried out for 14 days in March 2000 at the existing two dust monitoring stations when the highest dust impact was expected.

2.2 Monitoring Locations

The three dust monitoring locations were selected for 24-hour TSP sampling (AM1, AM2 & AM4) whereas two monitoring locations were selected for 1-hour TSP sampling (AM1, AM2). AM3 is an additional air monitoring station for 24-hour and 1-hour TSP which will be installed at the Ash Lagoon Decantrate Tower for impact monitoring. This station has not been set up in the first quarter of 2000 for baseline monitoring.

Table 2.1 tabulates the three dust monitoring stations for baseline monitoring. The locations of the monitoring stations are shown in Figure 2.1.

Table 2.1 Air Quality Monitoring Location

Location I.D.	Description
AM1	Reservoir
AM2	East Gate
AM4	Tai Yuen Village

2.3 Monitoring Parameters, Frequency and Duration

Table 2.2 summarises the monitoring parameters, monitoring period and frequencies of baseline air quality monitoring. The monitoring schedules for each station is summarised in Table 2.3.

Table 2.2 Baseline Air Quality Monitoring Parameter and Frequency

Monitoring Stations	Parameter	Period	Frequency
AM1	1-hour TSP	1500-1800	3 times/day
	24-hour TSP	0000-2400	Once every 6 days
AM2	1-hour TSP	1500-1800	3 times/day
	24-hour TSP	0000-2400	Once every 6 days
AM4	24-hour TSP	0000-2400	Once every 6 days

Table 2.3 Monitoring Schedules for the Monitoring Stations

Location	Monitoring Schedule	
	1-hour TSP	24-hour TSP
AM1	18/03/00 - 31/03/00	04/01/00 - 28/03/00
AM2	18/03/00 - 31/03/00	04/01/00 - 28/03/00
AM4	-	04/01/00 - 28/03/00

2.4 Monitoring Equipment

Continuous 24-hour TSP air quality monitoring was performed using the GS2310 High Volume Air Sampler (HVAS) and the MINIVOL Portable Sampler at AM1/2 and AM4 respectively. A TEOM Model 1400a continuous dust monitor was used to carry out the 1-hour TSP monitoring at AM1 and AM2. Table 2.4 summarises the equipment used in the baseline dust monitoring programme.

Table 2.4 Air Quality Monitoring Equipment

Equipment	Model and Make
24 hour sampling:	
HVAS Sampler	Model GS2310 Anderson Instruments Inc.
MINIVOL Portable Sampler	AIRMETRICS
1 hour sampling:	
Continuous TSP Dust Meter	TEOM Model 1400a Rupprecht & Patashnick

2.5 Monitoring Methodology

Instrumentation

High Volume Air Sampler model GS2310105-1, by Anderson Instruments Inc. was used for 24-hour TSP sampling at AM1 & AM2 (EPA Test Method Section 2.2 Reference Method for the Determination of Suspended Particulates in the Atmosphere)

- 20-60 SCFM adjustable flow range
- Elapsed-time meter for 24 hours operation
- Equipped with a flow recorder for continuous monitoring
- Mass flow controller for 24 hours sampling period

MINIVOL Portable Sampler by AIRMETRICS was also used for 24-hour TSP sampling at AM4.

- Programmable Timer
- Elapsed Time Accumulator
- Flow Controller controlling the operation flow rate at 5 liters/minute

TEOM model 1400a Continuous Dust Monitor, by Rupprecht & Patashnick was used to provide the 1 hour TSP data.

- Real time TSP concentration
- 5-minute; hourly; 8-hours and 24-hours TSP average can be provided
- Mass flow controller for precise flow control

Operating/Analytical Procedures

Air quality monitoring was conducted in accordance with the methodology specified in the EM&A Manual. Detailed operating/analytical procedures can be referred to the EM&A Manual.

2.6 Results And Observations

Results

Baseline air quality monitoring was conducted at the three dust monitoring stations AM1, AM2 and AM4. The result are summarised in Table 2.5. The detailed monitoring data of 1-hour and 24-hour TSP is presented in Annex A. Graphical presentations of the 1-hour TSP and 24-hour TSP results are shown in Annex B.

Table 2.5 Summary of the Baseline Air Quality Monitoring Results

	AM1 Average TSP Concentration, μg/m^3 (Range)	**AM2 Average TSP Concentration, μg/m^3 (Range)**	**AM4 Average TSP Concentration, μg/m^3 (Range)**
1-hour TSP	117 (31 – 262)	130 (45 – 297)	-
24-hour TSP	85 (11 – 195)	89 (15 – 191)	80 (11 – 171)

Observations

No major activities influencing air quality were identified during the baseline monitoring.

2.7 Action and Limit Levels

The Action and Limit levels were set in accordance with the conditions stipulated in the Environmental Monitoring and Audit Manual which is summarised as follows:

Table 2.6 Action and Limit Levels for Air Quality

Parameters	**Action**	**Limit**
1-hour TSP Level in μg/m^3	• For baseline level ≤384 μg/m^3, Action level = (130% x baseline + the Limit level)/2 • For baseline level >384 μg/m^3, Action level = Limit Level	500
24-hour TSP Level in μg/m^3	• For baseline level ≤200 μg/m^3, Action level = (130% x baseline + the Limit level)/2 • For baseline level >200 μg/m^3, Action level = Limit Level	260

Data collected at AM2 was used to determine the Action levels as these data represents the highest dust impact during the sampling period.

Following the above criteria, the Action and Limit levels for air quality are set for AM1 to AM4 as follows:

Table 2.7 Action and Limit Levels for 1-hour and 24-hour TSP

	Action Level, μg/m^3	**Limit Level, μg/m^3**
1-hour TSP*	340	500
24-hour TSP	190	260

* No Action/Limit Level for 1-hour TSP is applied to AM4 where no real time dust monitor is installed.

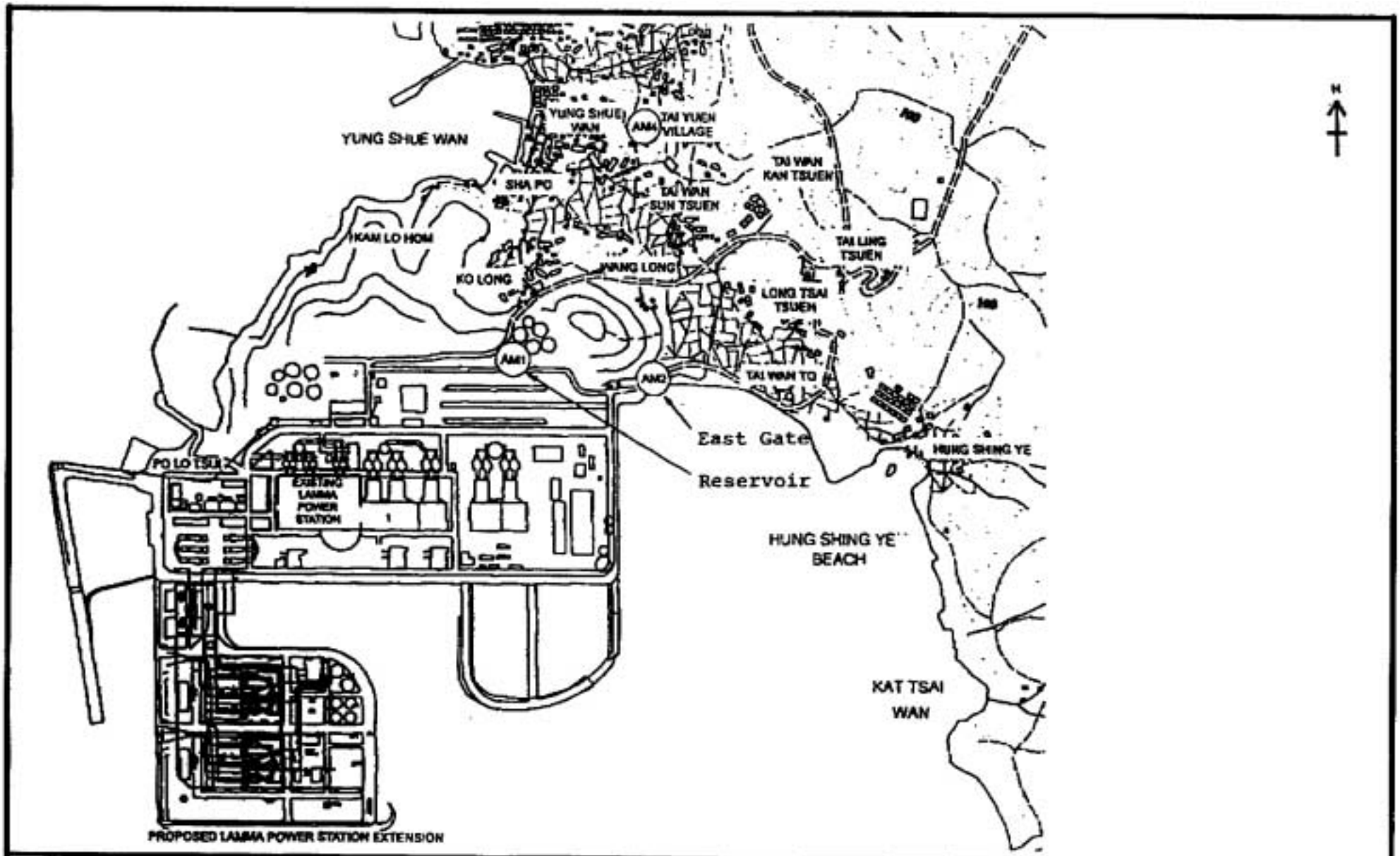

Figure 2.1 Locations of Air Quality Monitoring Station for the Construction of Lamma Power Station Extension