



INHALATION DOSE ASSESSMENT OF NATURAL RADIONUCLIDE USING DATA OF IMS RN65



ABSTRACT

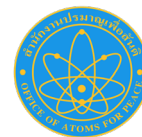
Every year during December and January high pressure has been covered the capital of Thailand and provinces in central part and result to air ventilation is limited in vertical transportation. Air pollution occurring in Bangkok has been horizontal flown to neighbor provinces including Nakhon Pathom where RN65 located. Very high density of PM_{2.5} dust has been continued reported by the Pollution Control Department. Health problem people experienced on dust inhalation significantly increased. Internal exposure dose from inhalation of dust attached with natural radionuclides also expected increased in the area of dust pollution. Activity concentrations of natural radionuclides such as of ⁷Be and ²¹²Pb reported in RRR during period of problem occurring are in used for assessing of inhalation dose people living near the RN65 station received from surface air. Finally, Statistical analysis of ⁷Be and ²¹²Pb activity concentrations with interesting factors were analysed and reported in this study.

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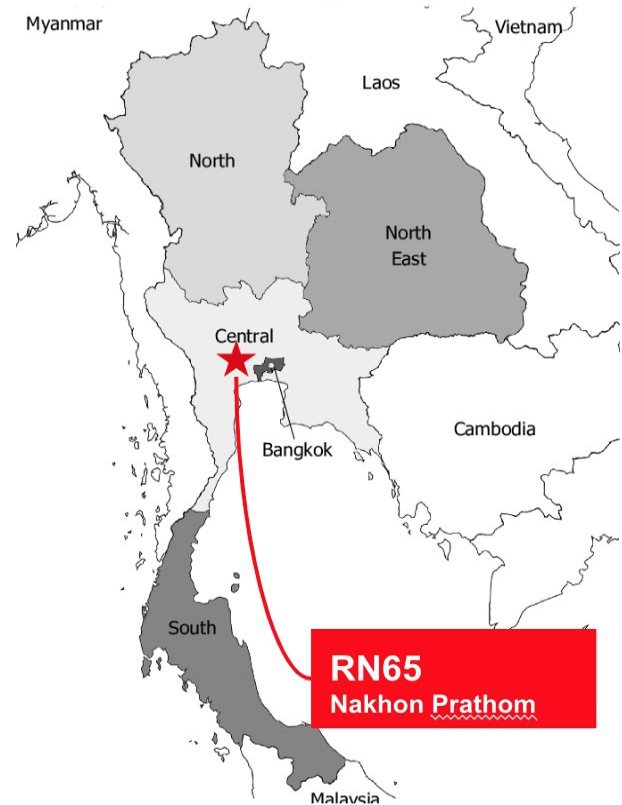
BACKGROUND

Station Information

- THP65 : Location Kasetsart University, Nakhon-Prathom, Thailand
- Installation date: Feb 2017
- Location coordination
Latitude: 14 01 42.5 N
Longitude: 99 58 12.1 E
- Certification date : 14 Dec 2018

Local Climate Information

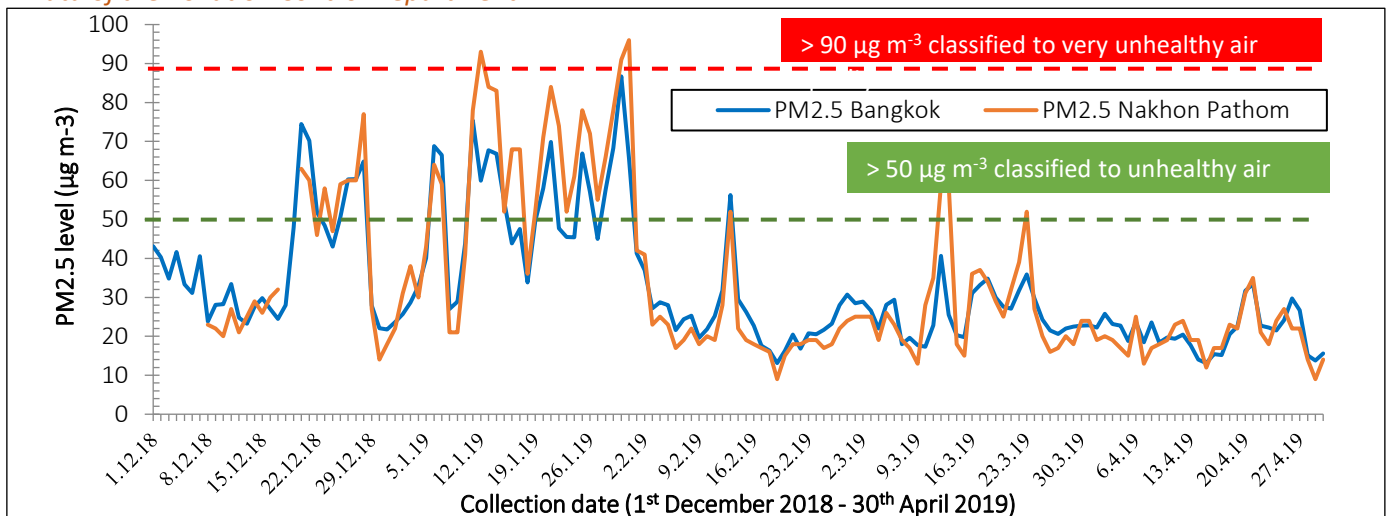
- Ambient temperature: 20-37 °C



Dust Pollution in Bangkok and vicinity

Recent years Bangkok and vicinity have been polluted by PM2.5 during dry season between December and February. PM2.5 and PM10 concentrations over healthy level have been reported by the Pollution Control Department.

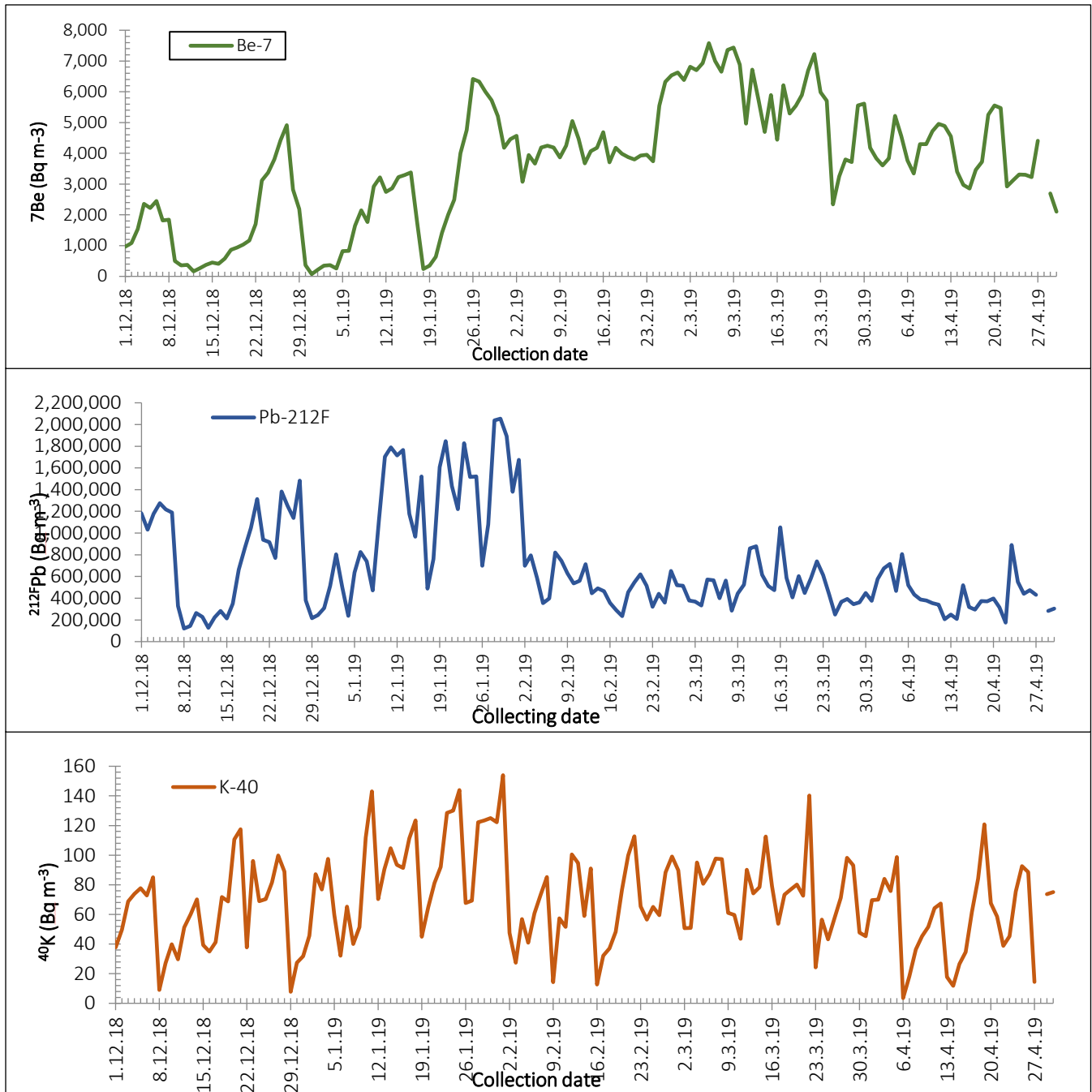
The 24 hrs average PM2.5 concentration in Bangkok and Nakhon Pathom from 1st December 2018 - 30th April 2019
**Data of the Pollution Control Department*



^7Be , ^{212}Pb AND ^{40}K CONCENTRATIONS OF PARTICULAR MATTER IN SURFACE AIR AT RN65

Natural radionuclides concentrations reported in Reviewed Radionuclide Report (RRR) are reliable and qualify for technical study. At RN65 ^7Be , ^{212}Pb and ^{40}K have been routinely reported daily.

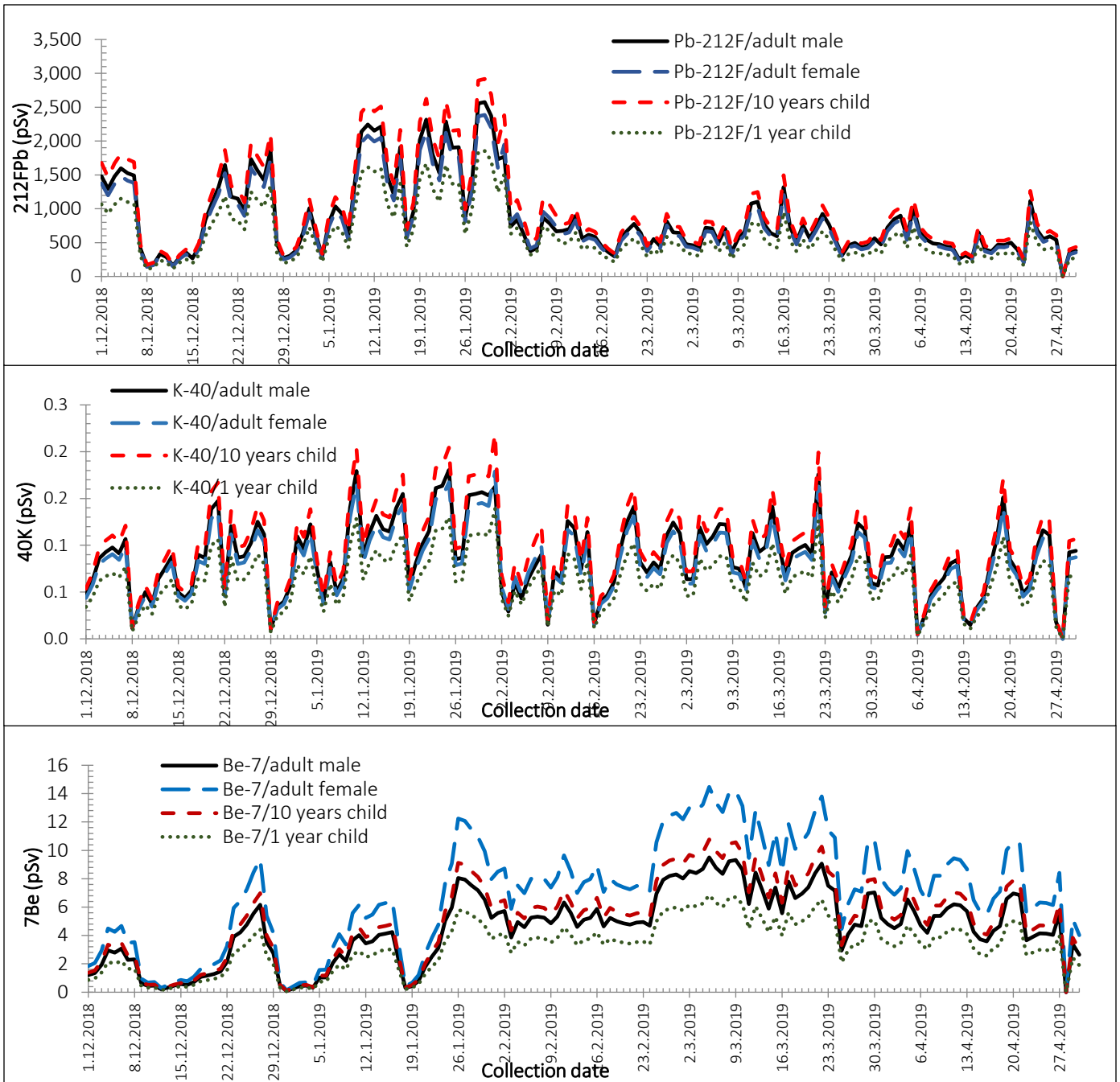
^7Be , ^{212}Pb and ^{40}K Concentrations in surface air at RN65 between 1st December 2018 and 30th April 2019



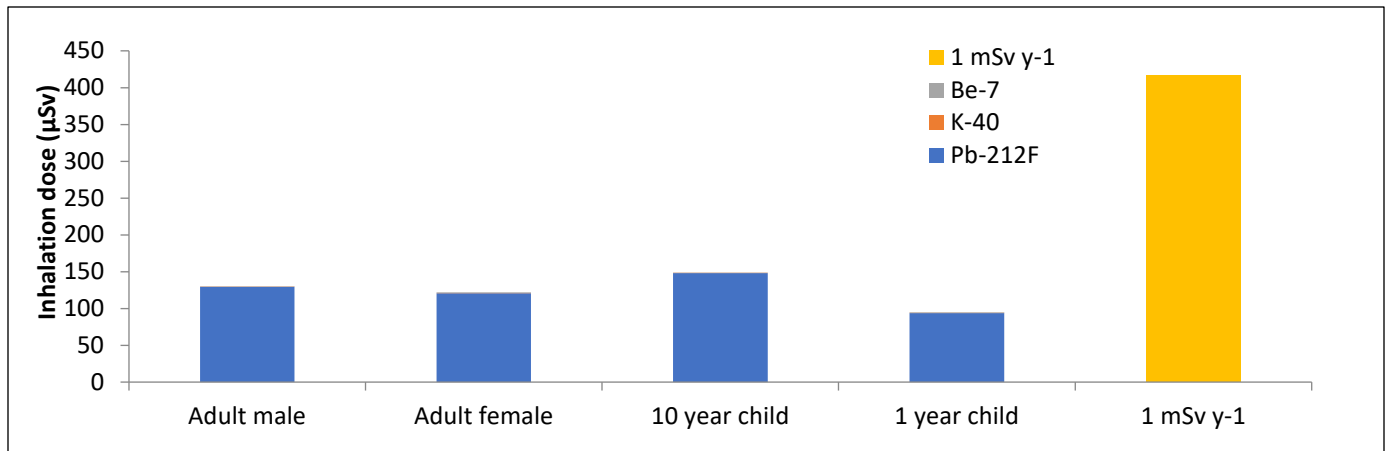
ESTIMATIONS ON INHALATION DOSE OF ^7Be , ^{212}Pb AND ^{40}K AT RN65

Inhalation dose ^7Be , ^{212}Pb and ^{40}K in Total Suspended Particulates (TSP) of surface air at RN65 were calculated using conversion factors recommended by the International Commission on Radiological Protection (ICRP) for four groups of people.

Radiation dose of ^7Be , ^{212}Pb and ^{40}K in Total Suspended Particulates (TSP) of surface air at RN65 for adult male, adult female, one year child and ten years child between 1st December 2018 and 30th April 2019



Calculated total dose of four groups of public received from inhalation ^7Be , ^{212}Pb and ^{40}K in air surface at RN65.



CONCLUSION

Dust pollution due to high concentration of PM_{2.5} and PM₁₀ occurring between December 2018 and January 2019 in Bangkok and several provinces in the central part of Thailand were well above the healthy level. Calculated inhalation doses in human received from ^7Be , ^{212}Pb and ^{40}K throughout two months of the dust pollution were much higher than doses human received in the next three months (February – April 2019). This was mainly because of growing up of ^{212}Pb and its daughters in surface air. However, the calculated inhalation doses were well below the ICRP dose limit for public calculated equally for five months (ICRP annual dose limit for public is 1 mSv).