



Air and Radiological Assessment – Milpera State High School

Introduction

PB was commissioned by the Department of Education, Training and the Arts (DETA) to assess the site occupied by the Milpera State High School (MSHS), for the suitability of ongoing use as an educational facility.

The purpose of the project is to provide a “snapshot” of the existing environmental conditions at the site in relation to the volatile organic, semi-volatile organic, aldehyde and ketone compounds in air. It was also required that an assessment of airborne particulate matter and radiological status including both ionising and non-ionising radiation be undertaken at Milpera State High School.

Scope of works

The following works undertaken as part of the project:

- Air quality assessment comprising the following analyses:
 - volatile organic compounds
 - semi volatile organic compounds
 - aldehydes and ketones.
- aerosol (particulate matter) survey
- ionising radiation survey
- non-ionising radiation survey

A control site, located within 2km of Milpera was also tested for air quality and particulate matter. This site provided a comparative location for the air quality assessment and aerosol assessment.

Air Assessment

An air quality assessment was conducted across the site at particular site locations to identify if any volatile organic compounds (VOC), semi volatile organic compounds (SVOC), aldehyde and ketones are present.

Volatile organic compounds were detected at low concentrations including the following:

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|----------------|---------------------|------------------|
| ▪ nonanal | ▪ methylacetate | ▪ 2-methylbutane |
| ▪ methylhexene | ▪ methylcyclohexane | ▪ isopropanol |

- limonene
- n-hexane
- dimethylcyclopentanes
- cyclohexane
- xylenes
- trichlorofluoromethane
- toluene
- 4-isopropyltoluene
- ethylbenzene
- dichlorodifluoromethane
- carbon tetrachloride
- benzene

No semi-volatile organic compounds were detected in samples collected during the course of the investigation.

Aldehyde & Ketone compounds were detected at low concentrations as the following:

- formaldehyde
- acetone
- propanal
- methyl ethyl ketone
- hexanal

Airborne concentrations of all compounds recorded at MSHS are consistent with those concentrations recorded at the control location (Western suburbs of Brisbane). Significant variations in concentrations recorded across the eight test site locations at MSHS were not detected.

Concentrations of all compounds measured were well below the relevant community health-based standards with virtually all compounds (except formaldehyde) recording concentrations less than 1/10th of the relevant community health-based standard.

The occurrence of several fires around Brisbane on the day of the assessment may have also contributed to the chemical loading of the airborne environment during the testing period.

Aerosols assessment

An aerosol assessment was undertaken to determine the quantity and size of particulate matter (PM) within the air.

- The initial aerosol assessment coincided with a number of bush fires throughout south east Queensland which produced unusually high air pollution in and around Brisbane. Due to the adverse atmospheric conditions and the questionable meaningfulness of the aerosol data collected, it was decided that a second aerosol assessment would be undertaken in November 2007.
- Airborne particulate matter concentrations were compared against the relevant NEPM as well as a 'control' site located within 2km of the MSHS and independent government test sites throughout Brisbane.
- Airborne particulate matter concentrations recorded at all test sites were well below the relevant NEPM Guideline and consistent with concentrations recorded at the 'control' site.

Radiological survey

PB engaged the Queensland Health Scientific Services (QHSS) unit of Queensland Health (QH) to conduct a radiological survey.

The radiological investigation found the following:

- External gamma radiation levels measured by absorbed gamma dose and real time dose-rate levels indicate that the gamma radiation on the site is within normal background levels.
- Radon in air concentrations measured using activated charcoal monitors found that radon levels at MSHS are of a similar levels to that found in the average Brisbane home.
- Soil samples taken from the site did not find the presence of radioactive materials above normal background levels.
- Analysis for removable contamination from surfaces around the site did not find the presence of radioactive contamination above normal background levels.
- The electromagnetic field survey recorded levels that were significantly less than the limit recommended by the National Health and Medical Research Council.

The radiological investigation at Milpera State High School found no evidence of ionising or non-ionising radiation levels above normal background levels. No further investigation regarding the radiological status of the site is considered to be required.

Conclusions and recommendations

Based on the investigation, the following findings are made:

- The low concentrations of compounds detected on the site were similar to the control sample site, and less than the community guidelines adopted for the investigation. On this basis it is considered that the air quality poses no greater risk to the school occupants' than that of normal background levels.
- The airborne particulate matter investigation at Milpera State High School found no evidence of elevated respirable dust levels above normal background levels. On this basis it is considered that airborne particulates pose no greater risk to the school occupants' than that of normal background levels.
- The radiological investigation at Milpera State High School found no evidence of ionising or non-ionising radiation levels above normal background levels. No further investigation regarding the radiological status of the site is considered to be required.
- Based on these findings, it is considered that the site is unremarkable for the parameters tested, and on this basis poses no greater risk to the school occupants' than that of normal background levels.