

**ABSTRACT**  
**SELECTED ENVIRONMENTAL QUALITY INDICATORS**  
**OF CLARK FREEPORT ZONE (PHILIPPINES)**

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Selected environmental indicators of Clark were examined to determine Clark's environmental condition as it is being developed as an economic zone. These are land cover change over time, water quality and air quality. Remote Sensing and GIS were used to analyze land cover changes using satellite images of various time episodes. For the assessment of water and air quality, comparative analysis of past data and actual sampling was made. Satellite images of Clark show Clark has recovered from the Mount Pinatubo eruption in 1991 and continues to increase its built-up area. Between 1993 and 2004, rate of increase of built up area in Clark was at 10 hectares/year, against increase of built up area in communities immediately outside Clark at 70 hectares/year. The built up area in the community cluster along a major highway, grew at a faster rate of 90 hectares/year. The satellite images established that the urban sprawl of community clusters outside Clark increased in both spatial spread and density. Density of built up area in 1989 was only 78% against 87% in 2004. Water sampling from the deeper aquifer where Clark currently sources its water yielded results within acceptable limits. However, a year-long monthly sampling from an abandoned well which taps from Clark's shallow aquifer continue to manifest dieldrin contamination at levels similar to values obtained ten years ago which was 9 times the allowed limit. The dieldrin values exhibit high and low monthly episodes, primarily controlled by seasonal variations in rainfall. The monthly and hourly ambient air values for PM10, CO, SO2, NO2, and O3 are all within acceptable limits. Air pollutants in Clark manifested a semidiurnal periodicity (two maxima) for the primary pollutants PM10, CO, SO2, and NO2; and a diurnal periodicity (one maximum) for the secondary pollutant O3. The maxima for the primary pollutants appeared to be principally influenced by volume of motor vehicles. Geographic Information System (GIS) was used to integrate the selected environmental quality indicators as a management tool in monitoring environmental condition of Clark. Based from the results, environmental indicators gathered and analyzed showed good quality condition of the environment in Clark at present time.