

## Archive of SID A Survey of Industrial Solid Waste Management in Tehran Municipality's 9th zone

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### Introduction

Rapid growth of technology, access to new systems of production and replacing plastics and unnatural fibers instead of natural materials increased the quantity of industrial solid waste and enhanced the hazardous nature of the wastes. Based on the Definition of the U.S. Environmental Protection Agency (EPA), hazardous waste includes waste, or combination of wastes that can be dangerous or potentially harmful to human health and other creatures. In Tehran megacity with a 7705036 population, 7000 tons of solid wastes per day have been generated in 2008. According to the municipality's division, Tehran is divided to 22 local zones. 9<sup>th</sup> zone of Tehran municipality with 7655183 square meters area consists of 2 districts and 8 sub districts.

Different industries are located within 20% area of the 7<sup>th</sup> sub district and the whole area of 8<sup>th</sup> sub district. The functional elements of industrial waste management in 7<sup>th</sup> & 8<sup>th</sup> sub districts are investigated in this article, and suggestions are made to improve the present status of solid waste management in the region.

Quality and quantity are the basis of planning for hazardous waste management system. In this context, selecting a combination of techniques, technology and management program is imperative to achieve the purposes of waste management, environmental protection and controlling pollution caused by hazardous waste.

The 9<sup>th</sup> zone of Tehran municipality with an area of 7655183 square meters has a population of 7705036. The 7<sup>th</sup> & 8<sup>th</sup> sub districts are of 3116671 square meters area. The total area of 8<sup>th</sup> sub district is occupied by industrial complexes. Fig. 1 shows the location of industrial area within the 9<sup>th</sup> zone of Tehran municipality.

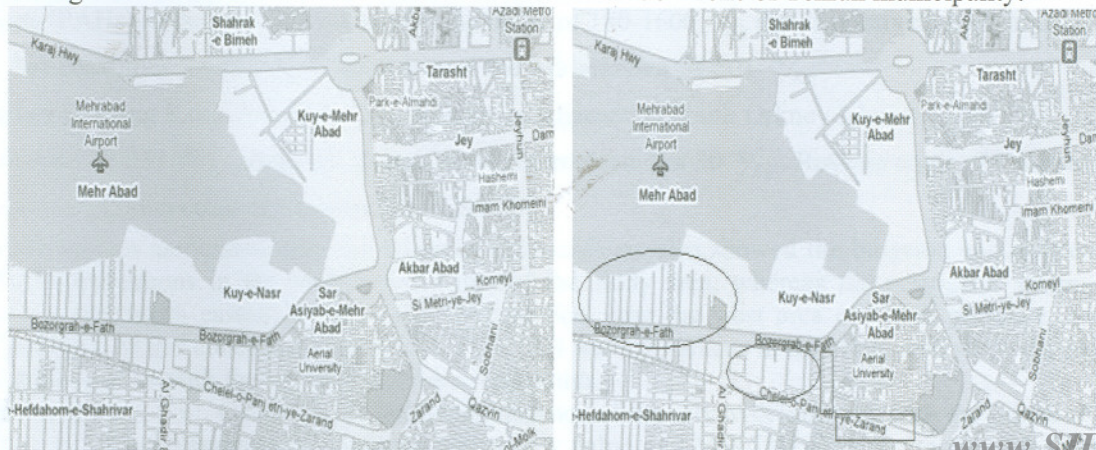


Fig.1: Map of 9th zone of Tehran municipality and the location industrial area

Most of the industrial factories located in the 9<sup>th</sup> zone are categorized as small units. Fig. 2 and 3 shows the distribution of industrial factories according to their size.

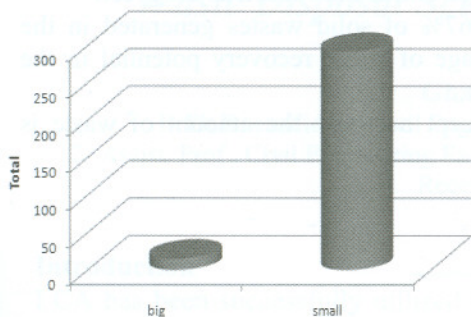


Fig. 2: Big and small industrial units of 9<sup>th</sup> zone

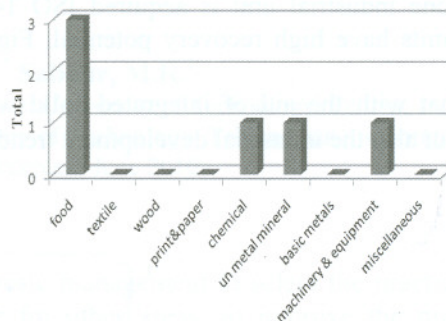


Fig. 3: Industries with environmental group

There are 307 industries in the 9<sup>th</sup> zone of Tehran municipality. 23 industry units are located in the 7<sup>th</sup> sub district and 284 units in the 8<sup>th</sup> sub district.

#### Materials and methods

The method of this article was on the basis of observation and completion of subjective questionnaires distributed among all small and great industrial units. For this purpose, the list of factory names and addresses was collected. Then a questionnaire was prepared and completed verbally in all units. As the next stage hazardous solid wastes was categorized according to Basel's convection.

#### Discussion of Results

Collected information shows that 4850,568 tons of solid waste per year is generated by 15 small industrial units and 292 big industrial units which are located in the 9<sup>th</sup> zone. Meanwhile machineries and equipment factories generate 2282,346 tons of waste per year. Chemical factories generate 351,341 tons of waste per year.

According to the Annex 3 Basel Convention, hazardous wastes were divided into 47 groups. These 47 groups were named y1 to y47. For example Waste oils/water, hydrocarbons/water mixtures, emulsions are listed in y9 group. This group makes up the major part of the wastes in the 9<sup>th</sup> zone of Tehran municipality.

In this zone all the wastes including industrial, house-hold and hospital wastes are managed together, without any segregation. As a result, some of the small industrial units store their wastes in vacant lands. Figures 4 and 5 respectively show different methods of industrial waste on-site storage and disposal in the 9<sup>th</sup> zone.

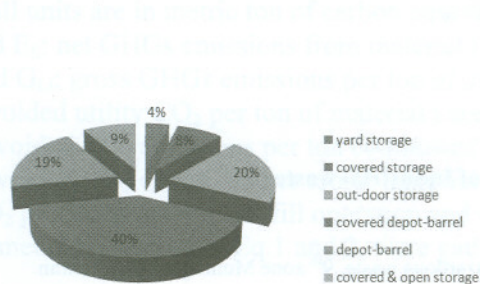


Fig. 4: different methods of on-side storage of industrial waste in the 9<sup>th</sup> zone

■ discharge ■ sale ■ barrow ■ burn ■ sale-barrow ■ burn-sale

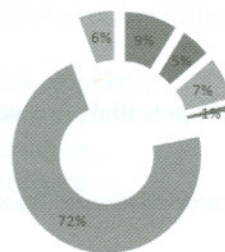


Fig. 5: Different methods for disposal of industrial waste in the 9<sup>th</sup> zone

### Conclusions

Most of the industrial units in this region have a passive approach toward the remarks made by environmental agencies (fig. 3). Among all the industrial units located in this area only one unit is introduced as the green Unit, and one industrial unit is acquired ISO 14000 license (fig. 6). 67% of solid wastes generated in the industrial units have high recovery potential. Fig. 7 shows the percentage of waste recovery potential in the region.

It seems that with the aid of integrated solid waste management concept not only the amount of waste is increased but also the industrial development trend will be maintained.

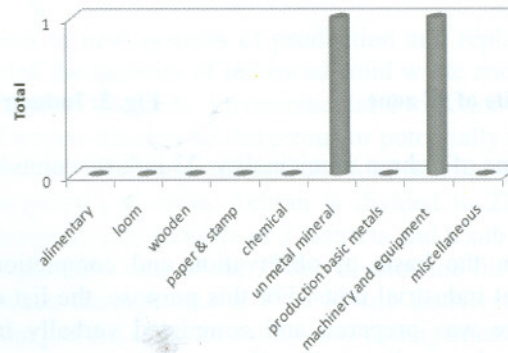


Fig. 6: Industries with ISO 14000 certificate or green industry

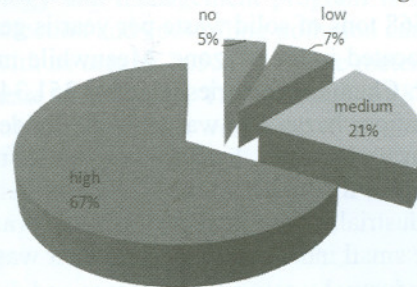


Fig. 7: potential of recycling or reuse of Industrial waste in 9<sup>th</sup> zone

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### Key words

Solid waste management, Industrial solid waste, Basel convention, Hazardous waste, 9<sup>th</sup> zone Municipality of Tehran