

**SURVEY REPORT**

**ENVIRONMENTAL SURVEY OF  
INDUSTRIAL ESTATE  
(I-9 & I-10)  
ISLAMABAD**

**DECEMBER 2006**

**GOVERNMENT OF PAKISTAN  
PAKISTAN ENVIRONMENTAL PROTECTION AGENCY  
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ISLAMABAD**

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# Survey Report

## Environmental Survey of Industrial Estate (I-9 & I-10) Islamabad

### 1. **Background Information:**

Industrial Estate Islamabad (IEI) was established in 1963. It houses more than 200 industries. The Capital Development Authority (CDA) is managing the industrial estate Islamabad. IEI is spread over 625 acres of land on the border of cities of Rawalpindi and Islamabad. There is a good network of roads within the estate. CDA is providing the water supply to the industries but numbers of industries have installed their own tube wells due to inadequate supply of water from CDA. The wastewater drains originating from the industrial units are connected to natural drains within the industrial estate. The natural drains eventually lead to a single main drain in the area, known as Nallah Lye. The entire electricity requirement of the industrial estate is being met by WAPDA. Similarly the natural gas facility is also available in the estate.

In the Master Plan of Islamabad IEI was isolated from residential area through a buffer zone, but now residential area has developed very close to it to the south and west due to elimination of buffer zone by CDA. IEI therefore is posing a pollution threat to the residents of the I-9 and I-10 sectors. From October to May, the wind blows from the estate towards the residential area. In summers, the wind blows towards the north and northwest towards Islamabad.

### 2. **Types of Industries at IEI:**

In order to comply with the orders of the Honorable Supreme Court of Pakistan, a monitoring team was immediately constituted to carry out the survey of Industrial Estate (I-9 & I-10) Islamabad to assess the overall environmental status of the area. Industry at IEI has been categorized into eight segments i. e. steel melting furnaces, re-rolling mills, flour mills, oil and ghee, marble cutting and polishing, pharmaceuticals, galvanizing and metal working and engineering. A list of industries and commercial units in Islamabad Industrial Estate is given in **Annexure – A**. Types of industries having potential of generating pollution and their approximate numbers are shown in table 1.

**Table 1: Types and Approximate Numbers of Industries in IEI.**

<b>Types of Industries</b>	<b>Approximate #</b>
1. Steel Melting Furnaces	8
2. Re-rolling Mills	11
3. Flour Mills	25
4. Oil and Ghee Mills	5
5. Marble Cutting and Polishing Units	31
6. Pharmaceuticals	10
7. Galvanizing	2
8. Metal Working and Engineering Units	23
<b>Total</b>	<b>115</b>

There are about 130 operating industrial units besides other commercial units. Types of industries and their exact numbers alongwith pollution levels will be compiled after a detailed survey, which has already been undertaken by Pakistan Environmental Protection Agency (Pak-EPA).

### **3. Environmental Conditions:**

#### **Ambient Air Monitoring:**

A comprehensive ambient air quality survey of Industrial Area Islamabad was carried out by Pakistan Environmental Protection Agency. Various ambient air quality parameters such as CO, NO<sub>x</sub>, SO<sub>x</sub>, Particulate Matter (PM<sub>10</sub>), Total Suspended Particulates (TSP) etc. were monitored to assess the status of ambient air in industrial area. The findings revealed that higher concentrations of PM<sub>10</sub> and TSP were due to industrial as well as vehicular activities in the vicinity. The concentration of PM<sub>10</sub> and TSP were 2.5 and 10 times higher than the acceptable standards respectively. It is pertinent to mention here that the above two ambient air parameters are basic to assess the ambient air quality with regards to steel furnace operation.

The recent environmental conditions at IEI and their impacts has been assessed as directed by the Honorable Supreme Court of Pakistan. The following is the present status. A detailed survey has also been undertaken.

#### **I. Steel Melting Furnaces:**

The steel melting furnaces are induction types being operated on electricity. Most of the surveyed units had one to two induction furnaces producing three tons of billets per batch. The operation of electric arc furnace is a batch process with a cycle time of three hours. Since no fuel is burnt in the furnace, theoretically there may not be any emissions. Practically pollution is generated due to poor quality of scrap bundled. Scrap which is being used by the melters consists mainly of spent containers of edible oils, paints, lubricants and even rubber other type of scrap i.e shredded is clean but costly as compared to bundled scrap, thus the first choice of steel melters is to use unclean scrap. Maximum pollution is generated at the time of light up when in the furnace temperature is low and scrap is contaminated with oil.

Steel melting industries are contributing heavily to air pollution in the industrial estate of I-9 & I-10. The operation of the induction furnace produces metal dusts, slag and gaseous emissions. Smoke is produced during charging of the furnace. The paint and other adherent volatile matter in the scrap escapes from the charge as the temperature rises. 12 Kg of particulate matter is produced per ton of product (at the most). The primary hazardous components of furnace dust are zinc, lead, and cadmium but its composition and contents vary with the scrap quality and furnace additives. At the electric induction furnaces used for melting metal scrap, workers are directly exposed to extremely high temperature and highly toxic gases rich in particulate matter of heavy metals, which poses serious health hazards. In addition to these, air emission from the industry includes NO<sub>x</sub>, SO<sub>x</sub>, CO, Particulate Matter and thick black smoke. Pak-EPA and CDA has maintained pressure on steel furnaces advising them to adhere to the National Environmental Quality Standards. As a result a few units have installed locally designed gadgets which are inefficient in controlling pollution. (Photographs of Steel Industry at **Annex-B**).

## **ACTION TAKEN BY PAK-EPA**

Pakistan Environmental Protection Agency has identified the following steel furnaces units generating excessive pollution in the industrial area.

- I. M/s S. H. Steel Ltd.
- II. M/s Pothar Steel Ltd.
- III. M/s Mumtaz Steel & F.S.L Group Ltd.
- IV. M/s Modern Engg. Steel Ltd.
- V. M/s R. K Steel Ltd.
- VI. M/s Itihad Foundry
- VII. M/s Zia Steel Mills Ltd.
- VIII. M/s Pak Iron & Steel Casting

A number of notices were served in the past to the above steel units and meetings were held in Pak-EPA and CDA advising to industry to adopt measures to control their pollution. Pak-EPA issued Environmental Protection Orders under 16 of Pakistan Environmental Protection Act 1997, to different steel industries and also directed them all the steel units to develop and submit their environmental improvement plan. The present status with regard to installation of anti pollution devices as giving in table below.

**Table 2: List of Steel Melting Units located at sectors I-9 and I-10**

<b>S. #</b>	<b>Name of Steel Industry</b>	<b>Weather antipollution equipments installed</b>	<b>Weather anti-pollution equipments working</b>
1.	M/S F.S.L. (Mumtaz) Steel Limited	Yes	Not Effective
2.	M/S Itihad Foundary	No	No
3.	M/S Modern Engineering	No	No
4.	M/S Potohar Steel Limited	Yes	Partially
5.	M/S Muhammad Hussain and Sons Ltd.	Yes	Partially
6.	M/S Zia Steel Ltd.	No	No
7.	M/S Pak Iron and Steel Casting	No	No

### **Actionable Points:**

- Antipollution devices may be installed over the induction furnaces with proper collection of vent gases so that the gaseous pollutants are not emitted at the work area and to the environment.
- Clean scrap with minimum volatile contents may be used in induction furnace.

## **II Re-rolling Mills:**

There are 11 re-rolling mills and using locally manufactured billets, which are reheated in gas or oil fired open –hearth furnaces. The red-hot billet is rolled into bars of required sizes and shapes. Except for the cooling water, which is used for cooling the rolls and may contain lubricants, otherwise there are no effluents. The only environmental related issue is the occasional discharge of black smoke, which emit when the furnaces are run on furnace oil in winter (During winter months, there is load shedding of gaseous fuels).

### **Actionable Points:**

- Industry may be adequately provided natural gas during winter so that they could avoid using furnace oil or mixture of furnace oil and natural gas. If it is not viable then anti-pollution devices may be made mandatory to control the emission gases from the furnaces.

## **III. Flour Mills:**

There are 25 flour Mills in the industrial area. In milling process wheat is dry cleaned, washed, milled and sieved. There is an overall loss of around 1.5 percent of the processed wheat, comprising mostly dust, stones and straw. The products are 80 percent flour, 10 percent bran and 10 percent starch.

The emissions contain minor quantities of flour dust, which is carried along with the air that carries the material through the milling process and is ultimately filtered and vented. Some very fine particles of flour escape from the system.

Effluent from flourmills consists of wheat washing water, which contains dust, some flour dust and straw. The Biological Oxygen Demand (BOD) is slightly higher of the flour mills effluent.

### **Actionable Points:**

- The effluents of this industry are generated by simple washing and grinding dust. The dust lifted into the atmosphere is fine flour and therefore non-toxic. Being a part of product, dust control is a concern for the mill owners and therefore receives due attention from the management. No action is required for this industry.

## **IV. Oil and Ghee Industry:**

Large quantities of steam are used as a main heating medium in ghee manufacturing processes. Steam is also used for creating the vacuum required in ghee manufacturing. The main energy source for the production of steam is natural gas. However, furnace oil is used during shortage in supply of natural gas.

Air emission usually not a serious problem for oil and ghee industries. The stacks of boilers are the main source of air pollution. Air emissions become a matter of serious concern only during these months when there is a shortage in the supply of natural gas and there is no other option but to use furnace oil. During this time, major air emissions from this industry could include NO<sub>x</sub>, SO<sub>x</sub>, CO and Particulate Matter.

The extremely high level of consumption of fresh water by these industries has resulted in generation of large volume of wastewater. Major wastewater pollutants from this industry include oil and grease, soaps and suspended solids.

### **Actionable Points:**

- Pollution-reduction techniques in ghee mills include water conservation, recycling of cooling and vacuum water. These measures can significantly help ghee mills to reduce both the volume and pollutant loading of their effluent.
- An efficient system should be used for the separation of fatty acids from the water used to create a vacuum in deodorizers.

## **V. Marble Cutting and Polishing Units:**

There are 31 units of marble cutting and polishing in the IEI. The main manufacturing processes are cutting and polishing of marble slabs and tiles. Initially the marble units were using dry cutting process but due to regulatory measures, majority of the units switched over to wet cutting. Significant quantity of fresh water is used mainly for two purposes:

- For the cooling of cutting blades; and
- To catch the dust formed during cutting

Water is showered on blades while marble blocks are cut into sheets of varying thickness. The water cools the blades and absorbs marble dust produced during the cutting operation. The wastewater from this operation is routed to a series of settling tanks. In these tanks the marble dust settles down partially and relatively clarified water is recycled. The settling tanks are not being used effectively due to arbitrary design and usage. The excess water displaced by the gathering sludge overflows without properly settling and is discharged into the effluent channels of the industrial estate. This water carries large amounts of marble powder, which gradually settles at the bottom of the drain channels. The marble sludge in the settling tanks is removed periodically and dumped in the vicinity of the factory. Eventually, the sludge dries in the sun and its particles become airborne. This causes air pollution problems for the inhabitants of the surrounding area. In some marble units, settling pits are not cleaned as scheduled, clogging effluent drain channels in the vicinity of the marble unit. Disposal of recovered sludge is the major environmental problem facing the marble manufacturing units. Another solid waste generated by the marble units is the cutting waste.

### **Actionable Points:**

- Settling tanks needs modification in design to allow sufficient settling time to the water passing through, so that expected minimum particle size is separated. Settling pits may be cleaned periodically.
- De-watering and drying of the sludge produces marble powder that can be used as filler in the plastic and rubber industry as well as in the construction industry. Industry can find appropriate economic disposal of their waste if not, than proper dumping of produced sludge may be managed.

## **VI. Pharmaceuticals:**

There are about ten pharmaceutical industries in IEI. Preliminary investigation revealed that these are formulating or packing facilities, not manufacturing units. The environmental impact of these industries is insignificant. Process related effluents are negligible. The occasional washing of formulation vessels may produce some wastewater in very minor quantities.

### **Actionable Points:**

- No actionable points are suggested at this stage. Some points may be suggested in future after through investigation of the industrial area.

## **VII. Galvanizing Industry:**

In galvanizing industry, materials is coated with a thin protection layer after passing through the following stages:

- Preparation of surface
- Galvanizing reaction
- Coating
- Post Treatment

In the surface preparation, acidic or alkaline degreasing solution is being used; in which the component is dipped. Hydrochloric acid or sulfuric acid is being used extensively to remove dust and scale.

Galvanizing process releases acidic fumes and generate waste waters and solid wastes. It has been observed by the EMT that acid fumes were being emitted from baths, while ammonia and ammonium chloride to the atmosphere from the galvanizing bath. Water discharge is released from pre-cleaning and after coating process.

### **Actionable Points:**

- Degreasing, pickling and galvanizing may be carried out in a confined area with proper emission control devices to protect the workers and the atmosphere from the Volatile Organic Compound (VOC), acidic and other fumes.
- Measures may be taken to protect the wastewater channels from spent acid and other material.
- Process and metal sludge may properly be disposed off.

## **VIII. Metal Working and Engineering Units:**

These units are non-polluting dry work places except for human wastes from washrooms, cafeterias and living quarters. Occasional spills of cutting lubricants and coolants are the only other discharges, which do not constitute an environmental problem.

### **Actionable Points:**

- No actionable point may be suggested for these units at this stage. Through investigation is required to point out environmental issues from these units.

#### 4. Detailed Survey

##### **Survey Form:**

A survey form was devised and distributed with the help of Environmental Inspectors of Pak-EPA to all industrial and commercial units located in these sectors (**Survey form is attached as Annexure – C**). The industrial units were asked to submit duly completed survey forms to Pak-EPA. Having received response from industrial units specific industry causing pollution will be targeted from pollutant reduction programme. The approach will be to open dialogue with the polluting industry to control pollution in a specific time frame. In case of non-compliance the industry will be subjected to penalty under section 17 of the Pakistan Environmental Protection Act 1997 or immediate stoppage of the unit.

#### 5. Recommendations:

- ❖ The major environmental problem at the Industrial Estate Islamabad is emissions from the steel melting furnaces. These industries may be directed to install efficient pollution devices in a specific timeframe.
- ❖ Currently, industrial units are discharging untreated effluent in the main drain, which eventually falls into River Soan. CDA may be directed to plan a Common Effluents Treatment Plant for the industrial estate. The individual units may be directed to install primary treatment system.
- ❖ CDA is currently establishing a scientific landfill at Kuri. They may be directed to provide a separate section for dumping of industrial waste.
- ❖ All industrial units situated in Industrial Estate Islamabad may be directed to get registered themselves in Self Monitoring and Reporting (SMART) Programme for industries initiated by Pak-EPA. Under this Programme, the industries will have to send test reports of their air emissions and liquid effluent periodically. These reports will be analyzed by the experts in Pak-EPA and industry will be encouraged to adopt green productivity programme in a specific time frame.

# PHOTOGRAPHS BY PAK-EPA MONITORING TEAM

## STEEL INDUSTRIES LOCATED AT SECTORS I-9 & I-10 ISLAMABAD.



Dump of local scrap



Billet Preparation



Sieving



Furnace Lining Material



Local Scrap



Mixed Scrap



Imported Scrap



Low Quality Scrap



Low Quality Scrap



Fixing New Furnace



Molding



Furnace in operation



Low Grade Local Scrap



Scrap Dump



Fugitive Smoke Emitting



Thick Smoke Emitting from Chimneys



Filthy Condition of Emission Treatment Unit



Thick Smoke Emitting from Factory Premises without Chimneys



Front View of Re-rolling Mill



Furnace in operation



Iron Billets



Fume Hood away from Furnace Mouth



Imported Scrap



Local Scrap



Furnace Charging, No Smoke Capturing Device



Shredded Scrap



Scrap with Waste Material