



Government of Pakistan
Ministry of Environment
Islamabad



NATIONAL IMPLEMENTATION PLAN (NIP)
FOR
PHASING OUT AND ELIMINATION OF
POPS FROM PAKISTAN
UNDER STOCKHOLM CONVENTION
ARTICLE 7 (a)

TABLE OF CONTENTS

TABLE OF CONTENTS	2
EXECUTIVE SUMMARY	3
ACRONYMS	17
1. INTRODUCTION.....	20
<i>Objectives of the National Implementation Plan (NIP)</i>	21
2. COUNTRY BASELINE	23
2.1. <i>Country Profile</i>	23
2.1.1. Location, Geography and Climate	23
2.1.2 Population, education, health and employment	27
2.1.3 Overview of the economy.....	30
2.1.4 Economic sectors	40
2.1.5 Environmental Overview	44
2.2 <i>Institutional, Policy and Regulatory Framework</i>	45
2.2.1 Environmental Policy and General Legislative Framework	45
2.2.2. Legislation and Regulations Addressing POPs Chemicals.....	50
2.3 <i>Assessment of the POPs Issues in Pakistan</i>	57
2.3.1 Assessment of POPs- Pesticides issue in Pakistan	57
2.3.2 Assessment of Polychlorinated Biphenyls (PCBs) issue in Pakistan	60
2.3.3 Assessment of Unintentional Persistent Organic Pollutants (U-POPs)	65
2.3.4. Present Management of POPs, Current Capacity and Experience	68
2.3.5. Public Information, Awareness and Education.....	68
2.3.6 Relevant Activities of Non-Governmental Stakeholder	69
3. STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN..	
(NIP).....	70
3.1. <i>Policy Statement</i>	70
3.2 <i>Implementation Strategy for National Action Plan (NIP)</i>	71
3.2.1 Objectives and Priorities of Action Plan.....	71
3.2.2 Overall Objectives	71
3.2.3 Constraints	71
3.2.4 Prioritization	73
3.3 <i>Activities, Strategies and Action Plans</i>	73
3.3.1 POPs Pesticides: Elimination and rational management of obsolete	
stocks/contaminated sites	73
3.3.2 Polychlorinated Biphenyls (PCBs): Elimination	81
3.3.3 Unintended POPs (PCDDs & PCDFs) : Reduction of emissions.....	88
3.3.4. Strengthening the Legislative Infrastructure for control of POPs and Enforcement,	
particularly in relation to action plan 3.3.1 to 3.3.3.....	102
3.3.5. Promotion of Awareness in relation to all action plans, but particularly for action...	
plan 3.3.1 to 3.3.3:.....	105
3.3.6. Strengthening of the Information Base, Surveillance and Data Management in.....	
relation to POPs:.....	109
3.3.7. Institutional Strengthening.....	113
3.3.8. Human Resources Development for Implementation of the Stockholm Convention	
NIP (in relation to all 3.3.1. to 3.3.7).....	116
ANNEXES	118

Executive Summary

The Stockholm Convention on Persistent Organic Pollutants (POPs) was signed by Pakistan on 6 December 2004 and ratified on April 16, 2008. In the context of enabling activities the draft of a National Implementation Plan (NIP) has been prepared which outlines the proposed programmes that would be required to meet obligations under the Convention. This document provides a policy framework, which lays out a road map for addressing the specific issues of POPs in Pakistan and aims to:

- (i) eliminate POPs pesticides, with rational management of obsolete stockpiles/contaminated sites;
- (ii) eliminate PCBs and PCB contaminated equipment, with decontamination and rehabilitation of contaminated sites
- (iii) reduce emissions of unintended POPs
- (iv) strengthen legal and institutional frameworks for managing POPs and chemical pollutants;
- (v) establish monitoring programmes for POPs and other chemical pollutants;
- (vi) enhance transfer of appropriate technology for control of POPs releases;
- (vii) Improve public information, awareness and education concerning hazards of POPs and their elimination.

Pakistan is a Federal country where Provincial governments, in partnership with the Federal Government, need to play a crucial role in implementing programmes for sound management of chemicals. Further, situations and priorities in relation to POPs vary among the Provinces and Federal Territories. Consequently this document also addresses issues at the level of the four Provinces: Balochistan, NWFP, Punjab, Sindh, as well as AJK and Northern Areas.

With the assistance of UNDP and the Global Environment Facility (GEF) Pakistan POPs Enabling Activity Project has undertaken a series of activities as components of the enabling activity project, namely: (a) preparation of inventories of POPs (b) promotion of awareness raising concerning POPs issues both at Provincial and Federal levels; (c) consultation with Provinces as to priorities for elimination or reduction of POPs; (d) identification of activities that would be required in Provinces and Federal Territories for implementation of the Convention; (e) dialogue with a wide range of stakeholders belonging to various government departments, the private commercial and industrial sector, civil society and academia etc. The inventories and consultations have provided a sound basis for the formulation of the National Implementation Plan (NIP).

This policy document is formulated in the context of the goal of environmentally sound and sustainable economic and social development for Pakistan. It is in line with the Poverty

Reduction Strategy Paper (PRSP) and the Pakistan's Development Vision 2020, both of which call for improvement in quality of life and social wellbeing. The vision is a guiding policy framework for Pakistan in its quest for sustainable development. The Millennium Development Goals (MDGs) serve as the guiding targets for Economic Growth and on reducing poverty, diseases and environmental degradation. The implementation of the NIP will therefore contribute to the national efforts of combating poverty and improve environmental quality resulting in enhanced quality of life and societal uplift. Further, the National Environment Policy provides an overarching framework for addressing the environmental issues facing Pakistan, particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of biodiversity, desertification, natural disasters and climate change. It also gives directions for addressing the cross sectoral issues as well as the underlying causes of environmental degradation and meeting international obligations. The Pakistan National Health Policy makers have been sensitized on relevant aspects of the NIP discussed during stakeholders dialogues organized by the POPs Project. In the light of many emerging global environmental concerns which demand joint efforts in reducing impacts to human health and the environment, there is a need for an integrated approach to sound management of chemicals and their wastes. The NIP as a policy document is meant to be dynamic so as to accommodate new interventions such as SAICM to the emerging global environmental concerns, requiring similar approaches. Consequently, synergies are being promoted among related Conventions and their implementation and among international processes on chemicals and waste management so as to realize multiple benefits, such as maximizing use of resources, sharing of knowledge and experience and integrated capacity building.

This NIP document has been prepared through a process of consultation and studies, which have included training and capacity building. A team was established at PAK EPA under the auspices of UNDP. UNITAR was chosen as the international coordination consultant. It provided guidance in the details of the process, taking part in meetings at Federal and Provincial levels, as well as training in aspects of undertaking inventories and in action plan development for a broad range of stakeholders. UNITAR also provided guidance in priority setting and reviewed inventories and the various materials which have constituted the NIP.

Initially, the project established sub task coordinators/ consultants in each of the Provinces to work with the local authorities and stakeholders in the process of preparing inventories. Following identification of priorities at the Provincial and Federal levels, and action plan training, a further team of experts were appointed to assist in the drafting of action plans in relation to the three areas of POPs (pesticides, PCBs and unintended POPs). Consultation with Provinces on a completed first draft NIP identified the areas for Provincial action in implementing the Convention. A final draft NIP was subsequently assembled for policy consideration and approval at Federal level.

The work of preparation of the NIP has identified the following gaps and deficiencies:

- I. Inadequate legal provisions on POPs production, screening, importation, use and disposal of their waste. Also on identification, liability and management of contaminated sites;

- II. Weak enforcement mechanisms, for example on disposal of wastes; illegal imports of POPs pesticides etc;
- III. The Plant Protection Act does not address detailed framework for the identification and quantification of pesticides stockpiles;
- IV. Lack of legal provision focusing on public awareness on health and environmental risks associated with POPs
- V. Lack of adequate legal provision for monitoring of POPs release and their effects to human environment;
- VI. There are no legal provisions focusing on POPs life cycle.
- VII. Inadequate awareness of importers and custom officers on imports requirements;
- VIII. Inadequate information on the past production, use, import and export;
- IX. Lack of continuing education to update skills for evaluation of technical data submitted during registration of pesticides;
- X. Lack of specialized skills and analytical equipment for identification of undeclared pesticides ingredients and monitoring of POPs levels;
- XI. Inadequate POPs inspectorate services;
- XII. Lack of guidelines on risk minimization procedures for handling, transportation, storage and disposal of obsolete stocks;
- XIII. Inadequate specialized skills, financial resources, equipment and working tools by respective institutions dealing with POPs;
- XIV. Poor storage facilities and inappropriate disposal facilities;
- XV. Improper disposal of empty containers of pesticides and PCBs equipment;
- XVI. Very few studies and little data on POPs environmental and health impacts;
- XVII. Poor information exchange and data keeping;
- XVIII. Inadequate resources for dissemination of information on the viable POPs alternatives;
- XIX. Lack of resources to ascertain suitability of alternatives and assess their risks to human health and the environment;
- XX. Inadequate resources to support preparation and execution of training and awareness raising programs;
- XXI. Lack of socio-economic and cultural studies on the acceptability and affordability of alternatives; and
- XXII. Inadequate record keeping of inventories for all POPs

The NIP proposes 8 action plans, three addressing each of the main groups of POPs, namely, pesticide POPs, PCBs and unintended POPs; and five addressing cross-cutting themes, namely,

Action Plan 1: Elimination of Pesticide POPs by 2012, and rational management of obsolete stocks/contaminated sites by 2015

By the end of 2010 to prepare a phased plan to safely store and ultimately eliminate an estimated 6030 MT of obsolete POPs containing pesticides from 425 identified sites by 2012, proposed to be undertaken through Provincial programmes.

Survey completed by 2012 of other obsolete pesticide stocks/contaminated sites (if any) not yet identified as containing POPs, including the necessary sampling and analysis.

A phased plan developed and implemented between 2010 and 2012 to safely store and ultimately eliminate remaining obsolete pesticides and rehabilitate all contaminated sites by 2015, proposed to be undertaken through Provincial programmes

A study designed by end of 2010 to identify and quantify sources of illegal POPs pesticides in Pakistan, with a view to proposing by 2013 measures to eliminate them.

Review completed by the end of 2011 of potential indigenous research for developing and promoting environmentally friendly alternatives to POPs pesticides under local conditions.

Action Plan 2. Polychlorinated Biphenyls (PCBs): Elimination by 2025

1. Completion by the end of 2013 of PCB survey of 471316 working and 376242 damaged transformers with planned sampling and analytical program to determine extent of PCB contamination, and identify equipment to be urgently replaced and sites needing rehabilitation.

2. Development with the electricity generation and transmission and other appropriate authorities by the end of 2013 of a phased PCB contaminated transformer elimination program, for implementation within the 2025 target, with urgent attention given to eliminating leaking equipment.

3. By 2012 prepare projects detailing program for decontamination and rehabilitation of sites contaminated with PCBs, for implementation by 2025.

4. By 2015 prepare a review of cost effective options for destruction of PCB contaminated oils and environmentally sound management of PCB contaminated equipment, as are expected to be generated through the decommissioning programme above, and prepare corresponding projects.

Action Plan 3. Unintended POPs (PCDDs & PCDFs) : Reduction of emissions

Based on current inventories of U-POPs, prepare by the end of 2011 a ten year projection of emissions, completing where necessary the inventories to include areas of the country not covered in the original inventories, and prioritise sectors for implementation of BAT and BEP.

Implement chosen BAT and BEP over the period 2012 to 2020 based on the results of the previous activity; costs and modus operandi to be developed in accordance with the chosen options.

Prepare a review during 2011 of government policies and programmes for energy use in the transportation sector, particularly the use of CNG, as to projected impacts/reductions in U-POPs emissions and recommend appropriate options for optimising the benefits from U-POPs reduction.

By end of 2011 examine and prepare a report with costed recommendations for action of local options applicable in Pakistan for environmentally sound management of various types of wastes, including uncontrolled open burning, particularly the cost effectiveness of incineration.

Implementation in a phased manner over a ten year period of chosen options for environmentally sound management of wastes in accordance with the recommendations of the earlier activities; costs and modus operandi depending on options chosen.

Develop by 2012 a program for phased implementation by 2020 of BAT and BEP for other areas, not initially chosen as priorities above.

Action Plan 4. Strengthening the Legislative Infrastructure for control of POPs and Enforcement, particularly in relation to action plans 1, 2, and 3.

Based on the review of legislation and situation analysis regarding its implementation develop, through a consultative stakeholder process, by the end of 2010, proposed appropriate regulations to fill gaps for Parliamentary or Administrative action by 2012, and propose mechanism to strengthen enforcement.

Establish by the end of 2010 an inspection and enforcement unit for environmental legislation, including those related to POPs, ensuring appropriate coordination mechanism with inspection and enforcement units of other Ministries particularly Agriculture, Health and Labour, and during the period 2010 to 2012 establish corresponding capacity at Federal and Provincial EPAs / EPDs and other related agencies.

Action Plan 5. Promotion of Awareness in relation to all action plans, but particularly for action plans 1, 2 and 3.

Development of a series of awareness programmes by 2011 for POPs, targeted for: the public, decision makers and specific target groups and implemented on a continuous basis thereafter.

A series of attitude changing campaigns planned by 2011, appropriate for specific plans of action to be implemented in accordance with the related action plan in a timely manner.

Action Plan 6. Strengthening of the Information Base, Surveillance and Data Management in relation to POPs:

Develop by 2011 program for health and environment surveillance of exposure to POPs, for implementation by health and environmental authorities from 2012.

Establish by 2011 a web based information management tool to promote improved access to data on POPs.

A program developed by 2011 for evidence based monitoring on a continuous basis of progress in implementation of NIP action plans.

Action Plan 7 Institutional Strengthening.

Establish by the beginning of 2011 a legally constituted coordinating mechanism for regular consultation among all stakeholders on implementation of the Stockholm convention

Develop by 2012 a program to strengthen the analytical capacity at selected existing laboratories for the proposed surveys, surveillance and monitoring programs for POPs, as related to Action Plans above.

Establish by mid 2010 a budgeted Chemical and Waste Management Centre/Project Management unit for promoting and monitoring the implementation of NIP, as well as other chemical and waste related international agreements, and for the regular updating of the National Chemical Management Profile in accordance with SAICM.

Prepare by the end of 2010 a project, involving all appropriate stakeholders, for implementing the Globally Harmonized System for Classification and Labelling of Chemicals (GHS), for implementation by 2012.

Prepare by 2011 a capacity building project detailing needs of federal and provincial Environmental Protection Agencies. Capacity development program to be implemented between 2011 and 2015 with emphasis on strengthening laboratory facilities.

Action Plan 8. Human Resources Development for Implementation of the Stockholm Convention NIP (in relation to all the other Action Plans)

Prepare by 2011, for ongoing implementation thereafter, a human resource development project to meet the requirements of implementation of the NIP at federal and provincial level after indepth need assessments with particular emphasis on strengthening the EPAs, to be updated as further action plans are developed.

At the Provincial levels the following proposed activities will need to be implemented to meet the requirements of the Convention:

Province of Punjab

Actions for the immediate future (next five years)

1. Phased elimination of 167 sites, with a total of 3,600 MT of obsolete POPs containing pesticides, with immediate action given to sites causing public nuisance*.
2. In coordination with the Federal authorities and other Provincial governments, undertake a market survey of illegal POPs pesticides, with a view to identifying:(i) the pesticides involved in illegal use, (ii) the extent of the problem of illegal use, and (iii) the possible origin of illegal POPs pesticides.
3. Undertake a survey of the PCBs content of (i) leaking transformers still in use, (ii) transformers in service, (iii) contaminated sites, including transformer reclamation workshops.
4. Establish environmentally sound and safe storage facilities for used PCB oils and PCB contaminated equipment.
5. Develop and implement an environmentally sound management plan for (i) domestic waste, (ii) medical/hospital waste, and (iii) industrial waste**
6. Develop and implement POPs issues awareness programmes for the public and relevant sectors**
7. In consultation with Federal authorities, consider if any Provincial or Local Authority legal action is required in relation to regulatory action to implement the Stockholm Convention.
8. Collaborate with Federal and other Provincial authorities, in implementing harmonized data collection and management as required under action plan 6**

* Will continue into the medium term period

** Will continue into medium and long term periods

9. Promote the development of human resources required at Provincial level to implement the NIP*.

Actions for the Medium term (5 to 10 years)

10. Phased implementation BAT and BEP for specific industrial processes, initially for (a) production of chemicals and consumer goods, (b) Steel melting & Rerolling (c) Electricity Generation+Transmission.

Actions for the long term (10 years and beyond)

11. Decontamination and rehabilitation of sites contaminated with POPs, particularly PCBs and POPs pesticides.

Province of NWFP

Actions for the immediate future (next five years).

1. Phased elimination of 3 sites, with a total of 49 MT of obsolete POPs containing pesticides, with immediate action given to sites causing public nuisance*
 2. In coordination with the Federal authorities and other Provincial governments, undertake a market survey of illegal POPs pesticides, with a view to identifying: (i) the pesticides involved in illegal use, (ii) the extent of the problem of illegal use, and (iii) the possible origin of illegal POPs pesticides.
 3. Undertake a survey of the PCBs content of (i) leaking transformers still in use, (ii) transformers in service, (iii) contaminated sites.
 4. Establish environmentally sound and safe storage facilities for used PCB oils and PCB contaminated equipment.
 5. Develop and implement an environmentally sound management plan for (i) domestic waste, (ii) medical/hospital waste, and (iii) industrial waste**
 6. Develop and implement POPs issues awareness programmes for the public and relevant sectors*
-
-

*** Will continue into the medium term period**

*** Will Continue into the medium term and long term period**

In consultation with Federal authorities, consider if any Provincial or Local Authority legal action is required in relation to regulatory action to implement the Stockholm Convention.

7. Collaborate with Federal and other Provincial authorities, in implementing harmonized data collection and management as required under action plan 6**
8. Promote the development of human resources required at Provincial level to implement the NIP*.

Actions for the Medium term (5 to 10 years)

9. Phased implementation of BAT and BEP for specific industrial processes, initially for (a) production of mineral products, (b) power generation and heating, (c) uncontrolled burning (d) non-ferrous metals industries etc *

Actions for the long term (10 years and beyond)

10. Decontamination and rehabilitation of sites contaminated with POPs, particularly PCBs and POPs pesticides.

Province of Sindh

Actions for the immediate future (next five years).

1. Phased elimination of 205 sites, with a total of 2016 MT of obsolete POPs containing pesticides, with immediate action given to sites causing public nuisance*
2. In coordination with the Federal authorities and other Provincial governments, undertake a market survey of illegal POPs pesticides, with a view to identifying: (i) the pesticides involved in illegal use, (ii) the extent of the problem of illegal use, and (iii) the possible origin of illegal POPs pesticides.
3. Undertake a survey of the PCBs content of (i)leaking transformers still in use, (ii) transformers in service, (iii) contaminated sites, including transformer reclamation workshops.
4. Establish environmentally sound and safe storage facilities for used PCB oils and PCB contaminated equipment.

* Will continue into medium term period

**Will continue into medium and long term periods

5. Develop and implement an environmentally sound management plan for (i) domestic waste, (ii) medical/hospital waste, and (iii) industrial waste **
6. Develop and implement POPs issues awareness programmes for the public and relevant sectors*
7. In consultation with Federal authorities, consider if any Provincial or Local Authority legal action is required in relation to regulatory action to implement the Stockholm Convention.
8. Collaborate with Federal and other Provincial authorities, in implementing harmonized data collection and management as required under action plan 6**
9. Promote the development of human resources required at Provincial level to implement the NIP*.

Actions for the Medium term (5 to 10 years)

10. Phased implementation of BAT and BEP for specific industrial processes, initially for (a) Electricity Generation and distribution (b) production of mineral products, (c) production of chemicals and consumer goods.

Actions for the long term (10 years and beyond)

11. Decontamination and rehabilitation of sites contaminated with POPs, particularly PCBs and POPs pesticides.

* Will continue into medium and long term periods

** Will continue into medium and long-term periods

Province of Balochistan

Actions for the immediate future (next five years)

1. Phased elimination of 5 sites, with a total of 136 MT of obsolete POPs containing pesticides, with immediate attention given to sites causing public nuisance*
2. In coordination with the Federal authorities and other Provincial governments, undertake a market survey of illegal POPs pesticides, with a view to identifying: (i) the pesticides involved in illegal use, (ii) the extent of the problem of illegal use, and (iii) the possible origin of illegal POPs pesticides.
3. Undertake a survey of the PCBs content of (i) damaged and leaking transformers still in use, (ii) transformers in service, (iii) contaminated sites, including transformer maintenance workshops.
4. Establish environmentally sound and safe storage facilities for used PCB oils and PCB contaminated equipment.
5. Develop and implement an environmentally sound management plan for (i) domestic waste, including open burning (ii) medical/hospital waste**
6. Develop and implement POPs issues awareness programmes for the public and relevant sectors**
7. In consultation with Federal authorities, consider if any Provincial or Local Authority legal action is required in relation to regulatory action to implement the Stockholm Convention.
8. Collaborate with Federal and other Provincial authorities, in implementing harmonized data collection and management as required under action plan 6**
9. Promote the development of human resources required at Provincial level to implement the NIP*.

Actions for the Medium term (5 to 10 years)

10. Phased implementation of BAT and BEP for specific industrial processes, initially for Non ferrous metals. (b) minerals.

* Will continue into the medium term period

** Will continue into medium and long terms periods

Actions for the long term (10 years and beyond)

11. Decontamination and rehabilitation of sites contaminated with POPs, particularly PCBs and POPs pesticides.

-
- * Will continue into the medium term period
 - * Will continue into medium and long term periods

ACRONYMS

AJK	Azad Jammu and Kashmir
AIDS	Acquired Immune Deficiency Syndrome
BAT	Best available techniques
BEP	Best environmental practices
BTU	British Thermal Unit
CAR	Crude activity rate
CBR	Central Board of Revenue
CNG	Compressed natural gas
CPI	Consumer price index
CPS	commodity producing sector
DDT	Dichloro diphenyl trichloroethane
EPA	Environmental Protection Agency
EPD	Environment Protection Department
EU	European Union
FATA	Federally administered tribal areas
FY	Fiscal Year
GAIA	Global alliance for incineration alternatives
GDP	Gross domestic product
GEF	Global Environmental Facility
GOP	Government of Pakistan
HBFC	house building finance corporation
HCB	Hexachlorobenzene
HIES	household integrated economic survey
HIV	human immunodeficiency virus
INGO	International nongovernmental organization
IPEP	International POPs elimination project
IPM	Integrated Pest Management
IPPs	Independent Power Producer
IUCN	The world conservation union
KANUPP	Karachi Nuclear Power Plant

KB	khushhali bank
KESC	Karachi electric supply company
KSE	Karachi stock exchange
KVA	Kilovolts amperes
LCV	Light Commercial vehicle
LOD	Level of detection
MAP	million acre-feet
MSDP	micro finance sector development program
MCHC	Maternal and child health centre
MINFAL	Ministry of Food, Agriculture and Livestock
MOE	Ministry of Environment
MSW	Municipal solid waste
MVA	Mega volts amperes
MW	Mega Watt
NDA	net domestic assets
NER	net enrolment rate
NFA	net foreign assets
NEAP	National Environmental Action Plan
NEP	National Environmental Policy
NEPRA	National Electrical Power Regulatory Authority
NEQS	National environmental quality standards
NER	Net enrolment rate
Ng/g	Nanogram per gram
NWFP	North-west frontier province
NGO	Nongovernmental organization
NIP	National Implementation Plan
NWFP	North western frontier province
Pak-EPA	Pakistan (Federal) Environmental Protection Agency
PCBs	Polychlorinated biphenyls
PCDF	Polychlorinated-dibenzofurans
PCDD	Polychlorinated Para dibenzo dioxins
PEPA	Pakistan Environmental Protection Act
PEPC	Pakistan Environmental Protection Council,

Pg/g	Picogram per gram
PIA	Pakistan air lines
POPs	Persistent organic pollutants
PRSP	Pakistan rural support program
PSLM	Pakistan social and living standards measurement survey
PTCL	Pakistan Telecommunication Corporation limited
RAR	refined activity rate
SBP	State Bank of Pakistan
SDPI	Sustainable Development Policy Institute
SECP	security and exchange commission of Pakistan
SME	Small and medium enterprises
SMART	Self-monitoring and reporting tool
TEQ	Toxicity equivalence
TB	Tuberculosis
UAAR	University of Arid Agriculture
UNEP	United Nations Environment Program
UNDP	United Nations Development Program
WAPDA	Water and Power Development Authority
WHO	World Health Organization
WTO	World Trade Organization

1. INTRODUCTION

Persistent Organic Pollutants (POPs) are highly toxic chemicals of anthropogenic origin causing an array of adverse effects, notably death, disease and birth defects among humans and animals. Certain POPs have been associated with cancers and tumours at multiple sites; neuro behavioural impairment including learning disorders; immune system changes; reproductive deficits of exposed individuals as well as their offsprings; and disease such as endometriosis, increased incidence of diabetes and others. Some Persistent Organic Pollutants are produced intentionally, such as those used as pesticides or involved in industrial processes, while others are generated unintentionally as by-products of various industrial or combustion processes. At present there are twelve chemicals that have been proved to exhibit POPs characteristics that are designated for elimination or emission reduction. They are composed of: intentionally produced pesticides; some industrial chemicals, which are Polychlorinated Biphenyls and Hexachlorobenzene; plus the unintentionally produced emissions of certain industrial and combustion processes.

Having realized the threats of the POPs, the global community agreed to take appropriate measures to reduce and ultimately eliminate the initial 12 chemicals that have been found to be the most dangerous to health and the environment. The Stockholm Convention was adopted in May 2001 for this purpose. This Convention contains strong provisions to reduce and eliminate releases of POPs to the environment. Among other things, the Convention aims to eliminate the production, use of POPs chemicals, that have been intentionally produced; to identify and remove of Polychlorinated biphenyls (PCBs) from use; to restrict DDT use to disease vector control in accordance to WHO guidelines; to minimize and where possible, ultimately eliminate those POPs formed as unintentional by-products and to eliminate releases of POPs from stockpiles and wastes. The Convention also calls for ceasing the production and use of new pesticides and industrial chemicals that have characteristics of POPs. The Convention establishes a register of specific exemptions for permitted production and use of POP Pesticides as well as acceptable use of DDT. It also provides the framework to expand the scientific monitoring of POPs levels in the environment.

Persistent Organic Pollutants (POPs) present unique challenge as they persist in the environment, bio-accumulate in fatty tissues of living organisms and pose risks of adverse effects to human health and the environment.

The Stockholm Convention on POPs entered into force in May 2004. The objective of the Convention is to protect human health and the environment from persistent organic pollutants starting with an initial list of 12 chemicals namely, Aldrin, Dieldrin, DDT, Endrin, Chlordane, Hexachlorobenzene, Mirex, Toxaphene, Heptachlor, Polychlorinated Biphenyls (PCBs), Polychlorinated dibenzodioxins (PCDDs) and Polychlorinated dibenzofurans (PCDFs).

Article 7 of the Stockholm Convention obliges each Party to develop and implement a plan for the implementation of its obligations under the Convention. The National Implementation Plan (NIP) for Pakistan elaborates current situation on POPs and states commitments and actions that it intends to undertake in the management and control of POPs for duration of 23 years starting from 2010.

The NIP has identified national challenges in management of POPs such as inadequate policy and regulatory regime; weak institutional capacity in terms of human resources and technical infrastructure; lack of facilities for sound disposal of wastes consisting of, containing or contaminated with POPs; very limited financial and technical resources for remediation of contaminated sites; lack of POPs release monitoring schemes; inadequate application of Best Environmental Practices (BEPs) and Best Available Techniques (BATs) for reduction of unintentional releases of POPs; and low awareness by the general public.

The focus of the NIP is in line with the National Environment Policy and Reduction of Poverty and the Pakistan's Development Vision 2020, both of which call for improvement of quality of life and social wellbeing. The Development vision is a guiding policy framework for Pakistan in its quest for sustainable development. The Millennium Development Goals (MDGs) serves as the guiding targets for the PRSP on reducing poverty, diseases and environmental degradation. The implementation of the NIP will, therefore, contribute to the national efforts of combating poverty and improve environmental quality.

Of recent, there have been many emerging global environmental concerns which demand joint efforts in reducing impacts to human health. POPs and other toxic chemicals pose challenges in protecting human health and the environment. **This NIP is meant to be dynamic so as to accommodate new interventions to the emerging global environmental concerns which require similar approaches to deal with.** This necessitates promoting synergies among related Conventions and international processes on chemicals management so as to realize multiple benefits such as maximizing use of resources, sharing of knowledge and experiences and integrated capacity building.

In view of the above, the Government is determined to implement the NIP and has already incorporated some provisions of POPs management in the Environmental Management. And shall make every effort to allocate funds and encourage participation of stakeholders in addressing the challenges posed by POPs. Cognizant of the fact that environment is the common heritage for present and future generations, the Government welcomes support of the relevant stakeholders in our struggle to eliminate POPs and other toxic substances.

Objectives of the National Implementation Plan (NIP)

The National Implementation Plan (NIP) for Pakistan elaborates current situation on POPs and states commitments and actions that it intends to undertake in the management and control of POPs for duration of 23 years starting from 2010, in the context of Stockholm Convention. Article 7 of the Convention encourages Parties to integrate their NIP into their national sustainable development plans where appropriate. Therefore, the Plan presents the strategic measures,

mechanisms and detailed activities that must be developed and implemented to make the elimination of POPs a reality. The NIP is intended to achieve the following objectives:

- I. To demonstrate commitment of the government to the objectives of the Stockholm Convention and to achieving compliance with the obligations assumed as a Party to it;
- II. To provide a national policy instrument and framework within which POPs issues are to be addressed as part of national policies on chemicals and waste management, environmental protection, public health and sustainable development;
- III. To initiate an information base and associated analysis supporting the development and implementation of effective Action Plans and Strategies to achieve reduction and elimination of POPs with associated improvement of environmental quality and human health;
- IV. To provide an operational and institutional framework for eligibility for financial assistance that might be provided under the Stockholm Convention's permanent financial mechanism for actions on POPs;
- V. To provide basis for monitoring the country's progress in addressing the POPs issue, and specifically the effectiveness of the actions it had committed to in reducing or eliminating POPs use and release to the environment;
- VI. To facilitate public awareness, education and participation in respect of the POPs issue and overall improvement in environmental and public health protection;
- VII. To facilitate country's overall efforts in coordinating national approaches to other chemical related Regional and International Agreements and international processes on life cycle chemicals management; specifically, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal; the Strategic Approach to International Chemicals Management (SAICM) and the Globally Harmonised System for Classification and Labelling of Chemicals.

2. COUNTRY BASELINE



[*http://www.heritage.gov.pk](http://www.heritage.gov.pk)

Pakistan country profile, institutional, policy/regulatory framework and an assessment of the persistent organic pollutants (POPs) issues in Pakistan are briefly described in the following pages.

2.1. Country Profile

Pakistan displays some of Asia's most magnificent landscapes as it stretches from the Arabian Sea, its southern border, to some of the world's most spectacular mountain ranges in the north. Pakistan is also home to sites that date back to world's earliest settlements matching those of ancient Egypt and Mesopotamia.

2.1.1. Location, Geography and Climate

Located in South Asia, Pakistan shares an eastern border with India and a north-eastern border with China. Iran makes up the country's south-west border, and Afghanistan runs along its western and northern edge. The Arabian Sea is Pakistan's southern boundary with 1,064 km of coastline. The country has a total area of 796,095 sq km and is nearly four times the size of the United Kingdom. From Gwadar Bay in its south-eastern corner, the country extends more than 1,800 km to the Khunjerab Pass on China's border*.

[*http://www.infopak.gov.pk/profile.aspx](http://www.infopak.gov.pk/profile.aspx)

Pakistan is a land of many splendours. The scenery changes northward from coastal beaches, lagoons and mangrove swamps in the south to sandy deserts, desolate plateaus, fertile plains, dissected upland in the middle and high mountains with beautiful valleys, snow-covered peaks and eternal glaciers in the north. The variety of landscape divides Pakistan into six major regions: the North High Mountainous Region, the Western Low Mountainous Region, the Balochistan Plateau, the Potohar Uplands, the Punjab and the Sindh Plains.

High Mountain Region: Stretching in the North, from east to west, are a series of high mountain ranges which separate Pakistan from China, Russia and Afghanistan. They include the Himalayas, the Karakoram and the Hindukush. The Himalayas spread in the north-east and the Karakoram rises on the north-west of the Himalayas and extends eastward up to Gilgit. The Hindu Kush mountains lie to the north-west of the Karakoram, but extend eastward into Afghanistan. With the assemblage of 35 giant peaks over 24,000 ft. high (7,315m), the region is the climbers' paradise. Many summits are even higher than 26,000 ft.(7,925 m) and the highest K-2 (Mt.Godwin Austin) is exceeded only by Mt. Everest.

The passes are rarely lower than the summit of Mt. Blanc and several are over 18,000 ft. (5,485 m). The Karakoram Highway, that passes through the mountains, is the highest trade route in the world. Besides, the region abounds in vast glaciers, large lakes and green valleys which have combined at places to produce holiday resorts such as Gilgit, Hunza and Yasin in the west and the valleys of Chitral, Dir, Kaghan and Swat drained by rivers Chitral, Pankkora, Kunhar and Swat respectively in the east. Dotted profusely with scenic spots having numerous streams and rivulets, thick forests of pine and junipers and a vast variety of fauna and flora, the Chitral, Kaghan and Swat valleys have particularly earned the reputation of being the most enchanting tourist resorts of Pakistan.

South of the high mountains, the ranges lose their height gradually and settle down finally in the Margalla hills (2,000-3,000 ft.) in the vicinity of Islamabad, the Capital of Pakistan, and Swat and Chitral hills, north of river Kabul. Although the climate of the region is extremely diverse, according to aspect and elevation, yet as a whole it remains under the grip of severe cold from November to April. May, June and July are pleasant months. The southern slopes receive heavy rainfall and consequently are covered with forest of deodar, pine, poplar and willow trees. The more northerly ranges and north-facing slopes receive practically no rains and are, therefore, without trees.

Pakistan boasts of the largest share of the highest mountain peaks in the world. Three of the mightiest mountain systems- the Hindukush, the Karakorams and the Himalayas- adorn the forehead of Pakistan. Pakistan has seven of the 16 tallest peaks in Asia. The statistics are simply baffling: 40 of the world's 50 highest mountains are in Pakistan; in Baltistan over 45 peaks touch or cross the 20,000 foot mark; in Gilgit within a radius of 65 miles, there are over two dozens peaks ranging in height between 18,000 to 26,000 feet. There are a total of 14 main peaks soaring above 8000 metres in the world. Out of these, 8 are located in Nepal, 5 in Pakistan and 1 in China. K-2 (8611m) is the second highest mountain the world.

There is a considerable trans-humane from the mountains to the plains in winter and from plains to the mountains in summer. The permanent settlers grow corn, maize, barely, wheat and rice on the terraced fields and also raise orchards of apples, apricots, peaches and grapes..

In the far-north of Pakistan are valleys which are closed within the silent, brooding forts of these mountains and are almost as high as the mountains themselves. Here dwell, from times

immemorial, various tribes differing in race and culture. If one tribe has Mongol features, its neighbour is obviously Aryan. Separated by insurmountable obstacles, these tribes very often live a totally land-locked existence blissfully unaware of the world beyond. But, a traveller is simply wonderstruck by one common element - Islam.

Pakistan has more glaciers than any other land outside the North and South Poles. Pakistan's glacial area covers some 13,680 sq.km which represents an average of 13 per cent of mountain regions of the upper Indus Basin. Pakistan's glaciers can rightly claim to possess the greatest mass and collection of glaciated space on the face of earth. In fact, in the lap of the Karakoram of Pakistan alone there are glaciers whose total length would add up to above 6,160 sq. km. To put it more precisely, as high as 37 per cent of the Karakoram area is under its glaciers against Himalayas' 17 per cent and European Alps' 22 per cent. The Karakorams have one more claim to proclaim; its souther flank (east and west of the enormous Biafo glacier) has a concentration of glaciers which works out to 59 per cent of its area. The Siachin glacier is 75 kms. The Hispar (53 kms) joins the Biafo at the Hispar La (5154.16 metres (16,910 ft) to form an ice corridor 116.87 kms (72 miles) long. The Batura, too is 58 kms in length. But, the most outstanding of these rivers of ice is the 62 kms Baltoro. This mighty glacier fed by some 30 tributaries constitutes a surface of 1291.39 sq. kms.

These western low mountains spread from the Swat and Chitral hills in a north-south direction (along which Alexander the Great led his army in 327 B.C) and cover a large portion of the North-West Frontier Province. North of the river Kabul their altitude ranges from 5,000 to 6,000 ft. in Mohamand and Malakand hills. South of the river Kabul spreads the Koh-e-Sofed Range with a general height of 10,000 ft. Its highest peak, Skaram, being 15,620 ft. South of Koh-e-Sofed are the Kohat and Waziristan hills (5,000 ft) which are traversed by the Kurram and Tochi rivers, and are bounded on south by Gomal River.

The whole area is a tangle of arid hills composed of limestone and sandstone. South of the Gomal River, the Sulaiman Mountains run for a distance of about 483 kilometers in a north-south direction, Takht-e-Sulaiman (11,295 ft.) being its highest peak. At the southern end lie the low Marri and Bugti hills. The area shows an extraordinary landscape of innumerable scarps, small plateaus and steep craggy out-crops with terraced slopes and patches of alluvial basins which afford little cultivation.

Kirthar Range South of the Sulaiman Mountains is the Kirthar Range which forms a boundary between the Sindh plain and the Balochistan plateau. It consists of a series of ascending ridges running generally north to south with broad flat valleys in-between. The highest peak named Kutte ji Kabar (dog's grace is 6,878 ft. above sea level. Bleak, rugged and barren as these hills are, they afford some pasturage for flocks of sheep and goats. The valleys are green with grass and admit cultivation up to a highest of 4,000 ft. Historical Passes

Although the country is in the monsoon region, it is arid, except for the southern slopes of the Himalayas and the sub-Mountainous tracts which have a rainfall from 76 to 127 cm. Balochistan is the driest part of the country with an average rainfall of 21 cm. On the southern ranges of the Himalayas, 127 cm. of precipitation takes place, while under the lee of these mountains (Gilgit and Baltistan) rainfall is hardly 16 cm. Rainfall also occurs from western cyclonic disturbances originating in the Mediterranean. It is appreciable in the western mountains and the immediate fore lying area; the rainfall average ranges from 27 to 76 cm. The contribution of these western disturbances to rainfall over the plains is about 4 cm. A large part of the

precipitation in the northern mountain system is in the form of snow which feeds the rivers. The all-pervasive aridity over most of Pakistan, the predominant influence on the life and habitat of the people, coupled with the climatic rhythm, characteristic of a monsoon climate, are conducive to homogeneity of the land.

Seasons: The four well-marked seasons in Pakistan are:-

- I. Cold season (December to March).
- II. Hot season (April to June).
- III. Monsoon season (July to September).
- IV. Post-Monsoon season (October and November).

The cold season sets in by the middle of December. This period is characterised by fine weather, bracing air-low humidity and large diurnal range of temperature. Winter disturbances in this season accordingly cause fairly widespread rain. Average minimum and maximum temperatures are 4 C° and 18 C°, though on occasions the mercury falls well below freezing point. The winter sun is glorious. The hot season is usually dry. Relative humidity in May and June varies from 50 per cent in the morning to 25 per cent or less in the afternoon. The temperature soars to 40 C° and beyond. The highest recorded temperature at Jaccobabad in June is 53 C°. While the interior is blazing hot, the temperature along the sea coastal ranges between 25 C° to 35 C°, but the humidity persists around 70 to 80 per cent.

The south-west monsoon reaches Pakistan towards the beginning of July and establishes itself by the middle of the month. The strength of the monsoon current increases from June to July; it then remains steady, and starts retreating towards the end of August, though occasionally, it continues to be active even in September when some of the highest floods of the Indus Basin have been recorded. From the middle of September to the middle of November is the transitory period which may be called the post-monsoon season.

In October, the maximum temperature is of the order of 34 oC to 37 oC all over Pakistan, while the nights are fairly cool with the minimum temperature around 16 oC. In the month of November, both the maximum and the minimum temperatures fall by about 6 oC and the weather becomes pleasant. October and November are by far the driest months all over the plains of Pakistan.

2.1.2 Population, education, health and employment

The population of the country is estimated at about 165 million. Density per square kilometre is 156 persons. Literacy rate is estimated to be 36.8 per cent. Of the four provinces, with 25.8 per cent of land area of the country, Punjab has 56.5 per cent of the total population; Sindh, with 17.7 per cent of land area, has 22.6 per cent; NWFP, (including FATA) with 12.8 per cent of land area, has 15.7 per cent; Balochistan, with 43.6 per cent of land area, has 5.1 per cent. Thus, Punjab is the most densely (240 persons per sq km) populated province, followed by Sindh and NWFP. Balochistan is the least populated province, with 19 persons per square kilometre. The overall population density urbanised of the country is 156 persons per square kilometre as estimated in 1994.

*<http://www.infopak.gov.pk/landpeople.aspx>

Sindh is the province with 43 per cent of the people living in urban areas including Karachi City. The urban population of Punjab is 28 per cent followed by NWFP, 21 per cent, and Balochistan 16 per cent. About 67 per cent of the total urban population of the country lives in 28 cities with population of 100,000 and above, while 57 per cent of the total urban population lives in 12 cities with population of 200,000 and above. Age Composition According to the Labour Force Survey, 1990-91, 46.93 of the population is under 15 years of age; 49.66 per cent is between the age groups of 15 and 64 years, while 3.41 per cent comprises persons 65 years old and above.

Right to education is the basic requirement of every individual. Nations all over the world reached high levels of prosperity and human development through investing and prioritizing provision of quality and equitable health and education facilities to their citizens. East Asian economies are a recent example that, show how nations can benefit from an educated and productive labour force. Pakistan is in fact, entering into that phase of demographic transition, where in few years massive influx in the working age population (60 million) is expected. Thus, Investing in providing quality education to the upcoming working age population, is the only way to cash the demographic dividend.

Currently, the literacy rate is 53 percent which is much below the targets set to be achieved in 2005 (60 percent ESR and 58 percent in PRSP) and far away from reaching the Millennium Development Goals (MDGs) target of 80 percent literacy till 2015. Looking at the gender disaggregated data for overall literacy, 65 percent of males and 40 percent of females were literate in the year 2004-05. District disaggregated data for adult literacy show that, in Punjab Rawalpindi with 75 percent is ranked at the top and Lohdran with 34 percent at the bottom. Karachi with 78 percent literacy is ranked at the top while Jacobabad with 43 percent is ranked at the bottom in Sindh. In NWFP, Abbotabad (65%) is at the top and Kohistan (25%) at the bottom. Finally, in Balochistan Quetta (65 %) at the top and Jhal Magsi (20%) and Qilla Saifullah (20%) are at the bottom.

The key impediments to the progress in reaching a higher level of literacy in Pakistan are the low enrolment rates. Net Enrolment Rate (NER) has seen a considerable increase of 10 percentage points from 42 percent in 2001-02 to 52 percent in 2004-05. The MDG targets to reach 100 percent NER till 2015. This requires almost 50 percent increase in enrolment in next 10 years, which is a huge challenge for the policy makers. Another factor that contributes to lower literacy rates is the high dropout rate at all levels. There exist wide gender gaps especially in the rural areas in enrolments at all levels.

In the past year, 2187 new primary schools were established, 1221 in the public sector and 881 in the private sector. This increase has occurred in both rural and urban areas. Enrolment at the primary level increased from 19.92 million in 2001-02 to 21.33 million in 2004-05, 4.28 million to 4.55 million at the middle level and 1.79 million to 1.88 million at the secondary level during 2001-02 to 2004-05. During the past four years 249 additional technical and vocational institutions were established. There is a significant increase of 35 universities during the period 2001-02 to 2004-05 including 13 new public and 22 new private universities.

Government of Pakistan is currently spending 2.1 percent of its GDP on education sector. The share of education sector has not seen much change in the past several years, in fact it has stagnated to about 2 percent from 2003-2005. Government has launched several programs to

increase coverage by increasing enrolment and to improve the overall quality of education but these initiatives need proper implementation and constant monitoring for their timely completion.

Importance of the health in the social lives of the people makes it such an important area that it cannot be considered in isolation and it is inextricably tied to other socio economic and political realities. The Constitution of Pakistan in its article 38 titled “promotion of social and economic wellbeing of the people” ensures the provision of basic necessities of life including health and medical relief for all citizens, irrespective of sex, caste, creed or race. Government of Pakistan recognizes and acknowledges the access to essential health care as a basic human right that is why the public health sector has always been a priority area of the government activities. Government of Pakistan is fully aware of its commitment to achieve Millennium Development Goals (MDGs) regarding health and initiatives have been taken to address health issues under PRSP and MTDF.

There is a considerable improvement in health care facilities over the past year as the existing vast network of health care facilities consist of 946 hospitals, 4554 dispensaries, 5290 basic health units/sub health centres (BHUs/SHCs), 552 rural health centers (RHCs), 907 maternal and child health centers (MCHs) and 289 TB centres (TBCs). Available human resource for the fiscal year 2005-06 turn out to be 118160 doctors, 6761 dentists and 33427 nurses which makes the ratio of population per doctor as 1310, population per dentist 25297 and population per nurse as 4636. The new health facilities added to overall health services include construction of 56 new facilities (42 BHU and 14 RHCs), upgrading of 59 existing facilities (18 RHCs and 41 BHUs) and addition of 3500 new doctors, 1900 nurses, and 15000 lady health workers. The total outlay on health sector is budgeted at Rs.40 billion which shows an increase of 5.3% over the last year and turns out to be 0.51% of GDP. To reduce incidence of disease and to alleviate their suffering and pain so as to improve the health status of people, various health programmes like Lady health worker program, Malaria, Tuberculosis, HIV/AIDS control program, the expanded program on immunization, National Maternal and child Health Program, Prime Minister Program for prevention and Control of Hepatitis in Pakistan, Drug Abuse, Cancer Treatment program remained operative during fiscal year 2005-06.

During the fiscal year 2005-06 the caloric availability per day is likely to increase from 2271 to 2328 and protein availability from 65.5 to 66.9 grams PSLM 2004-05 reports district level data for major indicators in the health sector such as sickness/injuries, immunization, pre and post natal consultation etc. In the case of immunization, the top ranked districts are Jhelum (Punjab), Hyderabad (Sindh), Chitral (N.W.F.P) and Gwadar (Balochistan). The districts reporting lowest immunization are Muzaffar Garh (Punjab), Jacobabad (Sindh), Shangla (N.W.F.P) and Qilla Saifullah (Balochistan). Government of Pakistan needs to address the problem of the adversely affected districts and focus on policies to solve the problems and initiate immediate remedial measures.

In Pakistan, labour force participation is estimated on the basis of the Crude Activity Rate (CAR) and the Refined Activity Rate (RAR). The CAR is the percentage of the labour force in the total population while RAR is the percentage of the labour force in the population of persons 10 years of age and above. The figures both for CAR (32.8%) and RAR (46.9%) for the first half of 2005-06 fare higher than LFS 2003-04 (30.4% and 43.7%). This phenomenon is more obvious for rural areas and women. Augmentation of the rates for the set of economic activities carried out within the house precincts also depicts the same scenario (42.8 Vs 38.5%). Agriculture still accounts for the largest source of employed work force. The share of agriculture in employment

has increased from 43 percent in 2003-04 to almost 45 percent by mid of 2005-06. Sector wise break up of employed labour force shows that female labour force participation is on the rise for most sectors especially agriculture, fishery and telecom sectors. It is important to note that the employment of the rural females increased despite a considerable rise in female Labour Force Participation Rate. The increase in rural female employment was mainly in the category of unpaid family helpers, which may be due to enhanced growth rates in agriculture in recent years or due to the combined efforts of various NGO.

2.1.3 Overview of the economy

Pakistan's economy has delivered yet another year of solid economic growth in 2005-06 in the midst of an extraordinary surge in oil prices and devastating earthquake of October 8, 2005, causing widespread damages. Pakistan industry and consumers continue to be the bright spot. Consumer spending remained buoyant and investors remained upbeat on the strength and sustainability of the current growth momentum, despite higher energy prices and natural calamities. With economic growth at 6.6 percent in 2005-06, Pakistan's economy has grown at an average rate of almost 7.0 percent per annum during the last four years (2002/03 – 2005/06) and over 7.5 percent in the last three years (2003/04 – 2005/06), thus positioning itself as one of the fastest growing economies of the Asian region. The growth momentum that Pakistan sustained for the last four years is underpinned by dynamism in industry, agriculture and services, and the emergence of a new investment cycle supported by strong credit growth. The pre-requisites for a sustained economic growth appear to have gained firm footing during the last four years.

The fiscal year (2005-06) has been an extra-ordinary year for the economy of Pakistan. At the very onset of the year the economy faced headwinds from rising oil prices, hovering around \$ 70 – 75 per barrel and putting severe strains on the country's trade balance on the one hand and budget on the other, and massive earthquake of October 8, 2005 causing extensive damage to property, infrastructure, school, hospital etc. and loss of over 70,000 human lives. The rescue, relief and reconstruction of earthquake affected areas also put budget under severe stress.

Pakistan's economy has proved itself as remarkably resilient in the face of shocks of extraordinary proportions. Growth has remained buoyant. Real GDP grew strongly at 6.6 percent in 2005-06 as against the revised estimates of 8.6 percent last year and 7.0 percent growth target for the year. Key drivers of this year's growth have been service sectors and industry. Large-scale manufacturing grew by 9.0 percent as against 15.6 percent of last year and 14.5 percent target for the year, exhibiting signs of moderation on account of higher capacity utilization on the one hand and strong base effect along with several other factors on the other hand. The services sector continued to perform strongly at 8.8 percent. Construction too continued to perform strong showing, partly helped by activity in private housing market, spending on physical infrastructure, and reconstruction activities in earthquake affected areas. Consumer spending remained strong and investment spending gained further traction. Pakistan's economy continues to maintain solid pace of expansion since the fiscal year 2002-03 recovery in the economy has been strong, rapid and sustained. During the fiscal year 2005-06, Pakistan's economic fundamentals have gained further strength.

Agriculture and particularly its crop sector could not perform up to the expectation especially major crops registered a 3.6 percent contraction in growth. Livestock, a major component of agriculture, exhibited strong showing and pulled the overall growth in agriculture to

2.5 percent as against the target of 4.2 percent. Livestock has been the only saving grace as far as the performance of agriculture is concerned this year.

Overall manufacturing, accounting for 18.2 percent of GDP, registered an impressive growth of 8.6 percent against the target of 12.0 percent and last year's achievement of 12.6 percent. *Large-scale manufacturing* grew by 9.0 percent as against 15.6 percent of last year and 14.5 percent target for the year, exhibiting signs of moderation on account of higher capacity utilization on the one hand and strong base effect along with several other factors on the other hand. *Small-scale manufacturing* grew at estimated 9.3 percent in 2005-06.

The Construction sector continued its strong showing, partly helped by activity in private housing market, spending on physical infrastructure, and reconstruction activities in earthquake affected areas. The construction sector is estimated to grow by 9.2 percent in 2005-06 as against extraordinary growth of 18.6 percent last year. *The services sector* grew by 8.8 percent in 2005-06 as against 8.0 percent of last year. Growth in the services sector in 2005-06 was primarily attributable to strong growth in the finance and insurance sector, better performance of wholesale and retail trade, as well as transport and the communications sector. *Finance and insurance sector* spearheaded the growth in the services sector and registered stellar growth of 23.0 percent during the current fiscal year 2005-06 which is slightly lower than 29.7 percent of last year. Value added in the *wholesale and retail trade sector* has increased by 9.9% over the previous year, compared to 11.1% growth last year. *The transport, storage and communications sector* grew by 7.1% compared to 3.5% growth last year.

Major contribution towards growth has come from the services sector which has emerged as a new growth power house for some time. The commodity producing sectors (agriculture and industry) has contributed one-third of the GDP growth and the services sector contributed the remaining two-third to the real GDP growth of 6.6 percent. The CPS contributed 31.7 percent or 2.1 percentage point to this year's growth while the remaining 68 percent or 4.5 percentage points contribution came from services sector. Within the CPS, agriculture contributed 0.55 percentage points or 8.4 percent to overall growth while industry contributed 1.54 percentage points or 23.3 percent. Within services sector wholesale and retail trade has contributed 27.9 percent or 1.84 percentage points to GDP growth. Pakistan's *per capita real GDP* has risen at a faster pace during the last three years (5.6% per annum on average in rupee terms) leading to a rise in average income of the people. Such increases in real per capita income have led to a sharp increase in consumer spending during the last three years. Per capita income defined as Gross National Product at market price in dollar term divided by the country's population, grew by an average rate of 13.9 percent per annum during the last four years – rising from \$579 in 2002-03 to \$847 in 2005-06. Per capita income in dollar term registered an increase of 14.1 percent over last year – rising from \$ 742 to \$ 847.

As opposed to an average annual increase of 1.4 percent during 2000-03, real private consumption expenditure grew by 13.1 percent in 2004-05 and further by 8.1 percent in 2005-06. Investment during the fiscal year 2005-06, gross fixed capital formation or domestic fixed investment grew by 30.7 percent as against a sharp rise of 28.6 percent last year. Private sector investment grew by 31.6 percent this year as against a growth of 29.1 percent last year. Major growth in investment by private sector is witnessed in agriculture (15.3%), manufacturing (14.4%), mining and quarrying (45.5%), construction (9.5%), transport and communication (20.2%), and wholesale and retail trade (424.5%). Public sector investment on the other hand registered massive growth of 46.7 percent as against a hefty 32.9 percent increase last year. The

growth in domestic investment was largely a public sector phenomenon last year but this year, it was mainly public-private sector partnership driven. Total investment increased from 18.1 percent of GDP last year to 20.0 percent of GDP in 2005-06. Fixed investment as percentage of GDP is estimated at 18.4 percent as against 16.5 percent last year. Both public sector investment and private sector investment as percentage of GDP have increased to 4.8 percent and 13.6 percent respectively, up from 4.4 percent and 12.1 percent last year. National savings as percentage of GDP stood at 16.4 percent in 2005-06 fractionally lower than last year's level of 16.5 percent. *Domestic savings* stood at 14.4 percent of GDP in 2005-06 slightly lower than 14.5 percent of GDP last year.

2.1.3.1 Poverty and Income Distribution

In Pakistan, the Poverty Reduction Strategy was launched by the government in 2001 in response to the rising trend in poverty during 1990s. Preliminary findings of Pakistan Social and Living Standards Measurement Survey (PSLM 2004-05) on poverty status were released at the end of February 2006, which indicates that the poverty level in Pakistan has been reduced during the last four years. A strong growth (*7.5 % on average*) for three years in a row, with per capita income growing at an average rate of 5.6 percent; a large inflow of remittances (*over \$ 4.0 billion per annum*) in recent years, a huge expenditure on poverty-related and social sector program, and many other interventions have made a significant dent to poverty in Pakistan.

As per HIES survey 2004-05, the percentage of the population living below the poverty line is *provisionally* estimated at 25.4 percent in 2005 — down from 32.1 percent in 2001. This suggests a decline of 6.7 percentage points in poverty in the last four years. More importantly, the rural poverty has declined more than urban poverty. The *provisional* estimates show that rural poverty has declined from 39.0 percent in 2001 to 31.8 percent in 2005 — a decline of 7.2 percentage points. Urban poverty on the other hand is *provisionally* estimated to have declined from 22.7 percent in 2001 to 17.2 percent in 2005 — a decline of 5.5 percentage points. The social sector and poverty related expenditures grew at an average rate of more than 20 percent per annum during 2001-05. There is nearly a three-fold increase in the projected PRSP expenditure for 2006-07 when compared with the actual expenditures of base year 2001-02. Within the various categories of pro-poor expenditure, human development comes out to be the priority item of the Government with expenditures under this head constituting, on average, more than 50 percent of all PRSP related expenditures. Further reduction in poverty, however, serves as a major challenge for the government. A clear lesson from the past four years of Pakistan and from other countries' experience is that sustained growth on a consistent basis is needed to reduce poverty.

2.1.3.2 Fiscal Development

Pakistan has gained further strength on fiscal side. Revenues are buoyant, expenditure is rationalized, fiscal deficit is at sustainable level and revenue deficit has almost been eliminated. Resultantly, Public debt is fast moving towards a sustainable level. Much progress has been made towards fiscal consolidation. The wide-ranging tax and tariff reforms as well as reforms in tax administration have started paying dividends. Tax collection by the Central Board of Revenue (CBR) has picked up. As a result of prudent fiscal management over the last 5 years, the burden of interest payment in domestic budget has declined sharply, thereby, releasing resources for development and social sector program.

During the five years from 2000-01 to 2005-06, tax collection by the CBR increased by 81.0%. The Central Board of Revenue (CBR) was targeted to collect Rs.690 billion but it is most likely to collect Rs.710 billion – Rs.20 billion more than the target and 20.6 percent more than last year.

The total expenditure remains more or less stable in a narrow band of 17 to 18.8 percent of GDP during the last six years. Substantial decline in interest payments from as high as 7.5 percent of GDP in 1998-99 to 3.1 percent of GDP in 2005-06, has provided fiscal space to reorient expenditure in favour of development expenditure. Resultantly the share of current expenditure in total expenditure declined from 89 percent of total expenditure in 1998-99 to 78 percent in 2005-06. In addition, the share of development expenditure doubled from 11 percent to 22 percent in the same period. During the last six years the development expenditure improved from 2.2 percent of GDP in 2000-01 to 4.2 percent of GDP in 2005-06. Second largest component of the current expenditure, namely, defence spending remained stagnant at around 3.1 percent to 3.3 percent of GDP during the last six years. Government is achieving the goal of fiscal stabilization without compromising spending on the social sector. Non-defence-non-interest expenditure has improved from 7.8 percent of GDP in 1999-2000 to 11.8 percent of GDP in 2005-06.

During the last six years the real growth in current expenditure hovered around 3 percent per annum and pace of growth has slowed down. Total expenditure grew by 3.4 percent in the first three years (2000-03) but accelerated to 5.6 percent during the last three years (2003-06). The main contribution is coming from development expenditure which grew by 7.4 percent per annum in first three years (2000-03) and by 23.8 percent in recent three years (2003-06).

Total consolidated revenues are targeted at Rs. 1095.6 billion in 2005-06 compared to Rs. 900.0 billion in 2004-05, an increase of 21.7%. This was primarily due to a rise of 22.2 percent in tax revenue on the back of increases in both federal and provincial tax revenues, which grew by 19.8% and 50.1%, respectively. Non-tax revenue increased by 19.3 percent in 2005-06 but remained stagnant at 3.8 percent of GDP.

In 2005-06, Pakistan is likely to face an overall fiscal deficit of Rs. 261.6 billion or 3.4% of GDP excluding earthquake effect and if we include earthquake related spending worth Rs.65.8 billion, the size of the deficit stood at Rs.327.3 billion or 4.2 percent of GDP. This revenue-expenditure gap was financed through external and domestic sources. Out of the gap of Rs. 327.3 billion, financing from external sources is expected at Rs 118.4 billion. The remaining gap of Rs. 208.9 billion is likely to be financed from domestic sources. Within domestic sources, financing from non-bank sources amounted to Rs. 22.4 billion while Rs. 96.7 billion would be contributed by the Banking sources, and Rs. 90.0 billion is to be financed through privatization proceeds. The revenue deficit (the difference between total revenue and total current expenditure), a measure of government dis-saving, was at a deficit of 0.7% of GDP in 2004-05 compared to a deficit of 2.2% in 2000-01. It has further progressed towards almost elimination at 0.03 percent of GDP in 2005-06.

The public debt- to-GDP ratio, which stood at almost 85 percent in end June 2000, declined substantially to 61.4 percent by the end of June 2005 – 23.6 percentage points decline in country's debt burden in 5 years. By end March 2006, public debt further declined to 54.7 percent of the projected GDP for the year. Following the debt reduction strategy in which raising revenue was one of the key elements, the public debt burden in relation to total revenue has declined substantially from 562.5 percent in 1999-2000 to 448.9 percent by end-June 2005 and further to

384.9 percent by end-March 2006 to the projected revenue for the year. During the last six years, the debt servicing liabilities have declined sharply from 65.4 percent of revenue in 1999-2000 to 27.8 percent of revenue and from 53.5 percent to 27.8 percent of current expenditure in 2005-06.

The ratios of domestic debt to GDP and to tax revenue both decreased during 2005-06. The stock of domestic debt as percent of GDP declined from 35.7 percent in 2003-04 to 32.8 percent in 2004-05 and further to 29.4 percent by end March 2006. As a result of prudent fiscal management over the last 6 years, the burden of interest payments on the domestic budget has declined sharply, thereby, releasing resources for development and social sector programs. Interest payments as a percentage of total revenue have been reduced to one-half (41 percent to 20 percent) over the last six years. Similarly, share in total expenditure declined from 30 percent to 16 percent during the same period. Most importantly, as percentage of GDP, interest payments declined from 6 percent to 2.6 percent in the last six years.

2.1.3.3 Money and Credit

The easy and accommodative monetary policy stance that had been pursued during the last few years by the SBP underwent considerable changes during the FY05, switching from a broadly accommodative to aggressive tightening in the second half of the last fiscal year, since April 2005. The same tight monetary policy stance continued during the current fiscal year despite declines in both core and overall inflation. Notwithstanding the tight monetary policy stance the SBP continued to strike a balance between promoting growth and controlling inflation on the one hand and maintaining a stable exchange rate environment on the other. Tight monetary policy stance is likely to continue until inflationary pressures are significantly eased off. The State Bank of Pakistan has taken a number of steps in various areas to further enhance the effectiveness of the banking industry in Pakistan. Going forward, the SBP would continue to take measures aimed at expanding credit to priority sectors such as agriculture, SMEs and export sector. To further revamp the financial sector in line with the global financial system, the State Bank of Pakistan has set out a road map for the implementation of Basel-II. It is the new regulatory capital adequacy regime, which offers a series of approaches ranging from simple to more complex methodologies for capital allocation against credit and operational risk.

The credit plan for 2005-06 set the target for monetary expansion at Rs 380 billion or 12.8 percent higher than last year (FY05) on the basis of a growth target of 7.0 percent and inflation target of 8 percent. The money supply during July-April 22, 2006 of the current fiscal year expanded by Rs 294.9 billion or 9.94 percent as against an expansion of Rs 332.4 billion or 13.37 percent in the same period last year. The pace of monetary expansion remained well within the Credit Plan target for the year (12.8%). Within the NDA, both net budgetary borrowings and borrowings for commodity operations remained well within the credit plan targets. The net credit to the Government for budgetary purposes was Rs 43.3 billion compared to the annual credit plan target of Rs 98 billion and Rs 15.0 billion borrowed in the corresponding period of last year. However, credit to the private sector has exceeded the credit plan target and stood at Rs 345.1 billion as against Rs 330 billion envisaged for the year in the credit plan. Expansion in NFA stood at Rs 37.8 billion owing mainly to the receipts of privatization proceeds and issuance of sovereign bond. The proceeds from privatization and sovereign bond not only helped build NFA; it also helped in containing the growth in NDA through the retirement of government debt held by the SBP.

Despite the tight monetary policy stance of the SBP, credit to the private sector was broad-based which grew by 20.2 percent (Rs 345.1 billion) during July-April 22, 2006 compared with the growth of 28.0 percent or Rs 357.4 billion during the same period of last year. Credit to the private sector continued to exhibit strong demand, reflecting the confidence of the private sector on the continuously improving macroeconomic fundamentals of the country. The manufacturing sector continued to be the largest recipient of bank credit, amounting to Rs 130.0 billion during July- March 2005-06, -- 17.1 percent more than the comparable period of last year and accounting for almost 47.9 percent of the credit to private sector businesses. The growth in consumer loans remained robust, and their scale expanded by 27 percent to Rs 67.2 billion. The consumer loans were acquired to finance a range of products including automobiles (Rs 23.2 billion) followed by personal loans (Rs 21.5 billion), credit cards (Rs 10.4 billion) and house building (Rs 10.1 billion).

Credit disbursement to the agriculture sector, also remained consistent with the previous year trend. Scheduled banks and DFIs advances to SME sector witnessed a growth of Rs 40.6 billion during July-February FY06 compared with an expansion of Rs 59.9 billion in the same period of last year.

The scheduled banks have opened 304 offices during the period from 01-04-2005 to 31-03-2006. During July-March 2005-06, there was an increase of Rs 303.9 billion (17.3%) in the net advances of the scheduled banks. Their deposits increased by Rs 272.9 billion (11.5%) and their total investments increased by Rs 77.1 billion during the first nine months of the current fiscal year. In 2005, the banking sector produced impressive results. The year has been unprecedented in terms of profits. Pakistan continues to be at the forefront of the Micro-Finance Sector Development Program (MSDP). Within the overall MSDP framework, Khushhali Bank (KB) is the lead micro-finance institution in Pakistan. The Bank now serves nearly 250,000 clients, with a cumulative disbursement of over Rs 6.0 billion in 75 districts of Pakistan with high poverty incidence. 60 percent of KB's clients are in the rural areas, roughly one-third being women.

2.1.3.4 Capital Market

During the fiscal year 2005-06, the stock market continued to maintain its strong performance and achieved new heights by creating many new records. Karachi Stock exchange (KSE)-100 Index crossed the barrier of 12000 mark for the first time in the history of capital market and touched an all time high on April 13, 2006. The KSE-100 index made further inroad and reached 12274 points on April 17, 2006 showing a growth of 64.7 percent over June 2005. Between December 2005 and April 2006 alone, the KSE share index increased by 25 percent. Similarly, the total market capitalization also increased to Rs 3419.4 billion on April 17, 2006 (US\$ 57.0 billion) from Rs 2013.2 billion (\$ 33.7 billion) showing a growth of 70 percent over June 2005. At current levels, KSE market capitalization is equivalent to about 44.3 percent of estimated GDP of FY06.

The improved performance of the stock market can mainly be attributed to consistent and transparent economic policies resulting in strong economic growth; a successful privatization process attracting foreign investors in prestigious organization like PTCL and National Refinery; sound monetary policy of the SBP, maintenance of fiscal discipline and the capital market reforms including development measures introduced by the stock exchanges with full support of the SECP. The government's economic policies and capital market reforms helped in promoting a fair, efficient and transparent capital market and restoring investors' confidence. The privatization of

the government entities through the bourses helped to broad base the equity ownership to a significant level.

The buying euphoria in the stock market has been spurred by a number of other favourable factors including continuation of the present policies on banking sector by the SBP, renewed interest of large number of buyers of shares, bright prospect of reaping dividends, good capital gains and presence of institutional investors in the market.

The KSE saw robust activity especially during the first 4 months of 2006, with all vital indicators pointing in the right direction.

The Securities and Exchange Commission of Pakistan (SECP) has been actively pursuing a capital market reform program geared towards the development of a modern and efficient corporate sector and capital market, based on sound regulatory principles that provide impetus for high economic growth. The reforms introduced over recent years, the fields of risk management, governance and transparency have contributed significantly towards the growth and development of capital market and building investor confidence.

During July-March 2005-06, the listed capital on KSE increased from Rs 438.49 billion to Rs 486.49 billion, reflecting an increase of around 11 percent. The market capitalization increased from Rs 2,071.18 billion to Rs 3,257.06 billion, reflecting an increase of over 57 percent in the value of shares. Similarly, the average daily turnover of shares increased from 430 million to 462 million shares. Unprecedented growth in the leading market indicators was also witnessed in Lahore and Islamabad Stock Exchanges.

During the calendar year 2004, total profit before taxation of the 12 trading groups amounted to Rs 229.5 billion, which increased to Rs 326.3 billion in 2005 recording a growth of 42.2 percent. Fuel and energy, banks and other financial institutions, transport and communications and cement were the trend setters in the stock market during the current fiscal year.

2.1.3.5 Inflation

For (July-April) 2005 -06, the inflation as measured by the Consumer Price Index (CPI), declined to 8.0% from 9.3% in the same period last year. Food price inflation averaged at 7.0% compared to 12.8% for the same period last year. Non-food inflation increased to 8.8% versus 6.9% in the comparable period of last year. Core inflation, which excludes food and energy costs from the headline CPI, also reflected a favourable trend and remained almost at last years' level of 7%. The larger contribution toward the overall CPI inflation come from Non-food, House rent, Energy and transport components of CPI. However, based on current trends, and barring any adverse shocks, it is expected that inflation would be within the target of 8% set by the government for the full year. Factor contributing to the build-up in inflationary pressures is the increase in aggregate demand in the economy, which is compounded by supply shortages of principal commodities. The supply side factors responsible for pushing the local price up, include an increase in support prices of wheat, wheat shortage resulting from inadequate production and lastly, the mis-management of wheat. Other issues to consider include, the significant increase in prices of pulses and the lower production of sugarcane and sugar. Furthermore, the high increase in International prices of sugar owing to a global shortfall in supplies, brought about by the production of ethanol in Brazil, have also led to inflationary pressures this year. The continuous

surge in International oil prices, coupled with an unprecedented rise in world prices of other commodities, also impacting prices in Pakistan.

Cognizant of the impact of inflation on the economy and its disproportionate effect on the poor and fixed income groups of society, the government has responded in a multi-pronged manner to the rise in the price level. A strategy of regular monitoring of domestic stocks of key commodities and their prices was adopted, by which the government was able to respond in a timely manner to shortages by importing substantial quantities of wheat, sugar, pulses and other essential commodities.

2.1.3.6 Trade and Payment

Pakistan's foreign trade sector is being affected both by structural and cyclical factors. On the domestic side, four years of strong economic growth strengthening domestic demand and triggering a consequent pick up in investment spending, have led to a massive surge in imports. On the external side, the global economy continues its strong and broad – based expansion with growth reaching close to 5 percent in 2006, with similar expansion projected for the next year – which will be the fifth successive year that the world economy has grown by more than 4.0 percent. Export during (July-March of the fiscal year, are up by 18.6 percent – rising from \$ 10183 million to \$ 12073 million in the same period last year. Thus, Pakistan is gradually moving towards higher value added in exports of textile manufacturers. The shares of value added exports have also increased. Pakistan doubled its exports in seven years and has increased its trade-to-GDP ratio from close to 26 percent in 1999-2000 to an estimated 34 percent in 2005-06.

Imports, on the other hand, have risen by 43.2 percent, in the first nine months (July-March) of the fiscal year – rising from \$ 14446 million to \$ 20693 million in the same period last year. Pakistan's imports continue to be pushed higher by unprecedented rise in oil prices and continued strength of non-oil imports owing to buoyant domestic demand. Major contributors to the substantial rise in food imports include wheat, sugar and pulses. Owing to domestic shortage, the government has liberalized its import regime and allowed duty free import of these three items to augment their supplies with a view to reducing food inflation in the country. Sugar alone contributed 74 percent to the rise in food imports. At the same time, sugar also contributed 26.6 percentage points to the 35.9 percent growth in food imports. Altogether, Wheat, sugar, and pulses alone contributed 93 percent to the rise in food imports and 33.4 percentage points to the 35.9 percent growth in food imports. In fact, if sugar production had remained normal and no shortages had emerged during the year, food imports would have risen only by 9.3 percent.

The unprecedented surge in domestic demand has fueled an exceptional increase in non-oil imports, registering a growth of 38.1 percent in the first nine months (July-March) of the fiscal year. Non-food non-oil imports also grew by 38.3 percent, reflecting continued strong domestic demand. Major contributors to the rise in machinery imports include power generation machine (44.8%), agriculture machinery (109.2%), construction and mining machinery (29.0%) and other machinery (51.7%). A surge in imports of machinery reflects a growth in domestic investment driven imports, thus allowing the expansion of the country's production base. Imports of petroleum group have also played a key role in taking Pakistan's import to a new height. Emerging as the single largest item in the country's import bill, the Petroleum group import amounted to \$ 4615.8 million, during (July-March), of the fiscal year, as against \$ 2806.6 million in the same period last year. Thus an increase of 64.5 percent resulted in an increase in trade deficit to \$82620.3 million, in comparison to \$ 4263.4 million in the same period last year.

Pakistan's **current account balance** that slipped into red in 2004-05 after posting surpluses for three consecutive years remained in deficit in 2005-06, with a widening gap due to a higher import bill. This was brought about by high global crude prices and a hefty rise in non-oil imports. Furthermore, higher freight charges by international shipping lines as a result of sharp increase in global trade and higher fuel cost, and growth in personal travel due to the rising level of income of middle and high income groups, have also contributed to the widening of current account gap.

Deceleration in the growth of net transfers is also responsible for widening of the current account deficit. The current account deficit, excluding official transfers, stood at \$ 4696 million in the first nine months (July-March) of the current fiscal year compared with \$ 1181 million in the same period last year. As percentage of projected GDP for the year the current account deficit stood at 3.7 percent as against 1.1 percent in the same period last year. Although trade deficit (fob) almost doubled over the last year and services balance deteriorated by 27.5 percent, the strong inflows under private transfers fuelled by rising workers' remittances and resident foreign currency accounts offset some of the negatives with current account deficit standing at \$ 4696 million. The flow under long – term capital (net) improved markedly and risen to \$ 3905 million from \$ 1633 million last year.

2.1.3.7 External Debt and Liabilities

Pakistan's total stock of external debt and foreign exchange liabilities grew at an average rate of 7.4 percent per annum during 1990-99 – rising from \$ 20.5 billion in 1990 to \$ 38.9 billion by end June 1999 but declined slightly to \$ 37.9 billion in 1999-2000. It exhibited a declining trend thereafter. Pakistan's external debt and liabilities have declined by \$ 3.1 billion – down from \$ 38.9 billion in 1998-99 to \$ 35.834 billion by 2004-05. However, external debt and liabilities increased to \$ 36.557 billion by end-March 2006, thus showing a rise of \$ 0.723 billion in the first nine months of the fiscal year. The rise is mainly on account of issuance of Sovereign bonds worth \$ 800 million in March 2006.

External debt and foreign exchange liabilities, instead of growing at the pace of the 1990s, were in fact reduced from U.S. \$38.9 billion in 1998-99 to \$ 36.5 billion by end-March 2006 — a reduction of \$ 2.4 billion in seven years. Most importantly, the burden of the debt has declined substantially during the same period. For example, the external debt and liabilities as a percentage of foreign exchange earnings which stood at 335.4 percent in 1998-99, declined to 127.6 percent by end-March 2006. The external debt and liabilities stood at 64.1 percent of GDP in end-June 1999, declined to 28.3 percent in end-March 2006. The annual debt servicing payments made during the period 1999-2000 to 2003-04 averaged just above \$ 5 billion per annum. This amount has drastically come down to around \$ 3 billion in 2004-05. An amount of \$ 2.4 billion has been paid during July-March 2005-06 and the amount rolled over declined from \$ 4.1 billion in 1999-2000 to \$ 1.1 billion in July-March 2005-06.

On March 23, 2006, Pakistan successfully issued US\$500 million new 10—year Eurobond and US\$300 million new 30—year Bonds in the international debt capital markets lead managed by JP Morgan, Citi group and Deutsche Bank. This transaction, which represented the first international 144A bond issued by Pakistan since 1999, raised significant interest amongst international Institutional investors. The 10—year notes were priced with a coupon of 7.125%, framing a spread of 240bps over the relevant 10-year US Treasury benchmark and 187bps over the US\$ mid-swap rate. The 30—year bonds were priced with a coupon of 7.875% to, framing a

spread of 302bps over the relevant 30-year US Treasury benchmark and 256bps over the US\$ mid-swap rate. Pakistan was able to achieve spreads on both the new 10 and 30—year bonds that were tighter than its previous 5—year issues. By issuing 10 and 30 year tranches, Pakistan completed its primary objective of establishing a full Pakistani International yield curve in record time. With over 170 accounts participating, books closed with total orders exceeding US\$2bn. The issue was over 2.5 times oversubscribed.

2.1.3.8 Energy

Global energy consumption is expected to increase steadily over the next twenty years. According to the International Energy Outlook 2001, the actual growth of world energy consumption increased from 207 quadrillion Btu in 1970, to 382 quadrillion Btu in 1999 which is anticipated to further increase to 607 quadrillion Btu in 2020. Over this fifty-year period, the consumption of energy will likely increase by about 200 percent, from 207 quadrillion Btu in 1970, to 607 quadrillion Btu in 2020. The largest increase in energy use will occur in the developing world. From 1999 to 2020, energy consumption in the developing countries is expected to climb 122 quadrillion Btu to 264 quadrillion Btu, depicting an increase of 116 percent. In other words, the increase in energy use in the developing world is roughly double that of all countries in the global economy. The reason for this is two fold. Firstly, many developing countries are striving towards economic development and industrialization and will thus require additional energy. Secondly, virtually all of the increase in the world's population over the next twenty years will take place in the developing world. Population growth will add over 1 billion people to the poorer regions, thus expanding the energy requirements for these regions.

Production of crude oil per day has decreased to 65,385 barrels during July-March 2005-06 from 66,199 barrels per day during the same period last year, showing a decline of 1.2 percent. The overall production of crude oil has decreased to 17.9 million barrels during July-March 2005-06 from 18.1 million barrels during the corresponding period last year, showing a decline of 1.1 percent. On an average, the transport sector consumes 49.7 percent of the petroleum products, followed by power sector (32.3 percent), industry (11.8 percent), household (2.5 percent), other government (2.3 percent), and agriculture (1.4 percent) during last 10 years i.e. 1995-96 to 2004-05. The average production of natural gas per day stood at 3,825 million cubic feet during July-March, 2005-06, as compared to 3,663 million cubic feet over the same period last year, showing an increase of 4.4 percent. The overall production of gas has increased to 1,048,190 million cubic feet during July-March 2005-06 as compared to 1,003,189 million cubic feet daily in the same period last year, showing an increase of 4.5 percent. On average, the power sector consumes 36.6 percent of gas, followed by fertilizer (22.5 percent), industrial sector (18.8 percent), household (18.4 percent), commercial sector (2.8 percent) and cement (1.3 percent) during last 10 years i.e. 1995-96 to 2004-05.

Total installed capacity of electricity (WAPDA, KESC, KANUPP AND IPPs) stood at 19,439 MW during July-March 2005-06, compared to 19,389 MW during July-March 2004-05. Total installed capacity of WAPDA stood at 11,363 MW during July-March 2005-06 of which, hydro accounts for 56.9 percent or 6,463 MW, thermal accounts for 43.1 percent or 4,900 MW. During the first three quarters of current fiscal year, 63,978 GWh electricity has been generated as against 61,758 GWh were produced in the same period last year. The number of villages electrified increased to 99,595 by March 2006 from 90,467 up to 2004-05, showing an increase of 10 percent. Presently, some 930 CNG stations are operating in the country, while 200 are under

construction. By March 2006 about one million vehicles were converted to CNG as compared to 700,000 vehicles during the same period last year, showing an increase of 43 percent. With these developments Pakistan has become the leading country in Asia and the third largest user of CNG in the world after Argentina and Brazil.

2.1.4 Economic sectors

Agriculture is the mainstay of Pakistan's economy. Nearly twenty-two percent of total output (GDP) and 44.8 percent of total employment is generated in agriculture. It also contributes substantially to Pakistan's exports. Agriculture also contributes to growth as a supplier of raw materials to industry as well as market for industrial products. Furthermore, 44.8 percent of country's work force is employed in agriculture, but 65.9 percent of country's population living in rural areas is directly or indirectly linked with agriculture for their livelihood. Whatever happens to agriculture is bound to affect not only the country's growth performance, but to a large segment of the country's population as well. Over the last five years, growth in agriculture has witnessed a mixed trend. During the first two years (2000-01 and 2001-02), the country experienced the crippling drought, which badly affected its agriculture and eventually overall growth in agriculture turned negative for these two years. In the preceding years (2002-03 to 2004-05), relatively better availability of irrigation water had positive impact on overall agricultural growth and this sector exhibited a modest to strong recovery.

However, the performance of agriculture during the fiscal year 2005-06 has been weak. Against the target of 4.2 percent and last year's achievement of 6.7 percent, overall agriculture grew by 2.5 percent in 2005-06, due to a relatively poor performance of major crops and forestry, and weaker one of minor crops and fishery. At the same time, Livestock has been the sole saving grace. Major crops, accounting for 35.2 percent of value added in agriculture, registered a decline of 3.6 percent as production of two of the four major crops, namely cotton and sugarcane has been significantly less than last year for a variety of reasons including, excessive rains at the time of sowing, high temperature at the flowering stage, late harvesting of wheat crop, a strong base effect (cotton) and lastly the incidence of frost, damaging sugarcane crop in the month of January, 2006.

The production of third major crop, namely wheat, remained more or less at last year's level at 21.7 million tons thereby registering a very small growth of 0.4 percent. The production of rice – the fourth major crop – has been the sole major crop which registered an impressive growth of 10.4 percent, but failed to turn the negative growth in major crops to a positive one. Minor crops, accounting for 12.3 percent of agricultural value added, barely managed to register a positive growth of 1.6 percent in 2005-06 as against a growth of 3.0 percent last year. The performance of livestock, the single largest sector accounting for almost one – half of agricultural value added, has been impressive as this sector grew by 8.0 percent on the back of substantial increase in the population of species, milk etc. The performance of fisheries has been poor as it grew by 1.9 percent only in 2005-06. Forestry has been registering negative growth for three consecutive years – registering a negative growth of 9.7 percent in 2005-06 as against a negative growth of 30.4 percent.

Pakistan's agriculture has been suffering, on and off, from a severe shortage of irrigation water in recent years. As against the normal surface water availability at canal heads of 103.5 million-acre feet (MAF), the overall (both for Kharif and Rabi) water availability has been less in the range of 5.9 percent (2003-04) to 29.4 percent (2001-02). Relatively speaking, the Rabi season faced more shortage of water than Kharif during these periods.

During the current fiscal year (2005-06), the availability of water for Kharif 2005 (for the crops such as rice, sugarcane and cotton) has been 5.5 percent more than the normal supplies and 19.8 percent more than last year's Kharif. Excessive winter rainfalls (January-March 2005) along with the melting of snow on mountains top were responsible for higher than normal availability of water during Kharif 2005. The water availability during the Rabi season (for major crop such as wheat), as on end of March, 2006 was estimated at 30.0 MAF, which was 17.3 percent less than the normal availability, and 29.8 percent more than last year's Rabi. Amongst major crops, cotton production is estimated at 12.417 million bales for 2005-06 lower by 13 percent over the last year's production of 14.265 million bales. Wheat production is estimated at 21.7 million tons in 2005-06, as against 21.612 million tons last year, showing an increase of 0.4 percent. Rice production has increased by 10.4 percent in 2005-06 from 5.025 million tons last year to 5.547 million tons in 2005-06. Sugarcane production, however, decreased from 47.244 million tons in 2004-05 to 44.312 million tons in 2005-06, showing a decrease of 6.2 percent. As regards the minor crops, the production of chillies and onions increased by 34.8 and 29.0 percent, respectively, during 2005-06.

The production of all the pulses, namely masoor, mung and mash are down by 13.5, 12.6 and 9.8 percent, respectively during 2005-06. Lesser production over last year is due to shortfall in area. The production of potato also decreased by 17.9 percent on account of frost, which affected the potato crop. Agriculture credit disbursement of Rs 91.161 billion during July-March, 2005-06 is higher by 23.5 percent, as compared to Rs 73.811 billion over the corresponding period last year. The fertilizer off-take stood at 2982 thousand nutrient tons in July- March 2005-06 or higher by 6.1 percent, as compared to 2811 thousand nutrient tons for the corresponding period last year

The overall **manufacturing sector** continued to maintain its growth momentum with more vigour during the current fiscal year. Overall manufacturing recorded an impressive and broad based growth of 8.6 percent, against a target of 12.0 percent and last year's growth of 12.6 percent. Large-scale manufacturing registered an impressive growth of 9.0 percent in the current fiscal year 2005-06 against a target of 14.5 percent and last year's achievement of 15.6 percent. The main contributors to this impressive growth of 9.0 percent in July-March 2005-06 over last year are the automobile group (29.76 percent), engineering goods group (6.46 percent), non-metallic mineral products (9.49 percent), leather products (10.91 percent), chemicals (9.08 percent), pharmaceuticals (14.83 percent) and electrical/electronic goods (11.78 percent). The items that registered positive growth were cotton cloth (0.07 percent) and cotton yarn (11.16 percent) in the textile group; cooking oil (17.6 percent) in the food, beverages and tobacco groups; nitrogenous fertilizer (4.46 percent), in the chemical group, cement (9.75 percent) in the non-metallic mineral products group and Jeeps & Car (29.9 percent), LCV's (29.3 percent) and motorcycles/scooters (15.04 percent) in the automobile group.

The individual items exhibiting negative growth include; sugar (2.40 percent), coke (77.39 percent), power looms (24.67 percent) and billets (47.95 percent). The output of the **mining and quarrying sector** grew by 3.8 percent this year as against the rise of 9.6 percent last year. The principal minerals which have shown positive growth are: baryte (11.4 percent), limestone (9.9 percent), natural gas (4.5 percent), rock salt (13.2 percent), sulphur (5.4 percent) and gypsum (12.6 percent). While negative growth was exhibited by chromite (6.7 percent) and magnetite (10.7 percent). Foreign direct investment has witnessed an increase of 238.7 percent in (July-April, 2005-06), whereas, net foreign private investment stood at US \$ 3376 million against US \$ 1027 million last year, thereby, showing increase of \$ 2349 million. The increase in foreign private

investment is because of the inflow of portfolio investment of \$ 355.8 million as compared to inflow of \$ 135.5 million in the comparable period last year. The privatisation program maintained its pace during 2005-06 and succeeded in privatising some high-ticket items despite an inhospitable global environment. By end April 2006, Pakistan had completed or approved 160 transactions at gross proceeds of Rs 985 billion. This includes 57 transactions for Rs. 337.908 billion completed during October 1999 to April 2006.

A strong, efficient and affordable infrastructure is a critical element of a good investment climate and therefore, is a pre-condition to sustain the growth momentum. **Transport and Communications** both are important elements of infrastructure services and are essential in maintaining economic growth and competitiveness. In fact, the transport and communication sector in Pakistan account for about 11 percent of GDP, 16 percent of fixed investment, 6 percent of employment and about 15 percent of the Public Sector Development Programme. Road transport is a backbone of Pakistan's transport system, accounting for 90 percent of national passenger traffic and 96 percent of freight movement. Over the past ten years, road traffic – both passenger and freight – has grown much faster than the country's economic growth. The 9,518 km long National Highway and Motorway network contributes about 3.7 percent of the total road network and carries 90 percent of Pakistan's total traffic. The total length of roads in Pakistan was 258,340 Km, including 165,762 Km of high type (64 percent) and 92,578 Km of low type roads (36 percent) by the end of March, 2006. During the outgoing fiscal year, the length of high type roads has increased by 1.8 percent over the last year but the length of low type roads has declined by 2.9 percent.

The Pakistan Railways have carried 61.3 million passengers and 4.3 million tons freight, with its gross earnings stood at Rs.12.5 billion during July-March 2005-06. In comparison, PIA carried 3.972 million passengers during July-February 2005-06 as against 3.571 million in the same period last year, showing an increase of 11.2 percent. Both passenger capacity and traffic volume also increased by 2.4 percent and 8.7 percent, respectively. PIA fleet consists of 41 aircrafts of various types. In addition, there are three private airlines, operating in the country and provide both domestic and international services. Karachi Port has also handled 24,572 thousand tons of cargo during July-March, 2005-06, compared to 21,845 thousand tons during the same period last year, showing an increase of 12.5 percent. Port Qasim has handled 16.8 million ton of cargo during July-March 2005-06 compared to 16 million cargo handled during the corresponding period last year, registering a growth of 5 percent. The Gwadar Port is also being built with Chinese assistance and its first phase has almost been completed.

In 1999-2000, there were only 0.3 million cellular mobile subscribers in Pakistan which jumped to 2.4 million by 2002-03 as a result of introduction of CPP regime and addition of another mobile operator (Ufone). Mobile subscribers continued to rise at an unprecedented pace, reaching 12.8 million by 2004-05. A major turnaround was witnessed when the mobile companies started giving free mobile connections and bearing the cost of government levies themselves. In a short period of 9 months in the outgoing fiscal year, more than 16 million new subscribers have been added to the list, reaching over 29.6 million by end April 2006. In other words, a more than 131 percent increase in subscribers in just 9 months was unprecedented. Accordingly, the total tele-density (Fixed + Cellular + WLL) has jumped from 3.7 percent in 2001-02 to 23.1 percent by end March 2005-06.

For promotion of Information Technology, 2339 cities/towns/villages have been provided Internet facility, by March, 2006. Total fixed telephone lines installed by March 2006 were 5.2 million as against 5.1 million up to June 2005 last year.

Housing is one of the basic human requirements, as every family needs a roof. Providing shelter to every family has become a major issue as a result of rapid urbanization and higher population growth. According to the housing census 1998, the housing backlog, which stood at 4.30 million, has been currently projected at 6.19 million. It is estimated that to address the backlog and to meet the housing shortfall in the next 20 years the overall housing production has to be increased to 500,000 housing units annually. The present housing stock is also rapidly aging and estimates suggest that more than 50 percent stock is over 50 years old. It is also estimated that 50 percent of the urban population now live in slums and squatter settlements. Meeting the backlog in housing, besides replacement of out-lived housing units is beyond the financial resources of the Government. This necessitates putting in place a framework to facilitate financing in the formal private sector and mobilize non-government resources for a market based housing financed system. The government of Pakistan is, therefore, encouraging participation of local as well foreign investors/developers and private sector companies in housing sector to build more and more housing projects to meet the demands of a vast segment of society.

Having realized the importance of the housing sector in the overall economic development of the country, the government, as an immediate measure, declared Housing and Construction as a priority industry and simultaneously formulated a pragmatic and workable National Housing Policy. This is aimed at revitalizing the housing sector, providing therein various incentives for the construction industry and the private sector builders/developers. The salient features of this policy include:

- (i) to identify the state and other lands for housing development
- (ii) to encourage the financial institution to give mortgage loans for housing at market rates. Commercial banks shall also be encouraged to advance loans for housing, by earmarking a substantial percentage of their loan portfolio
- (iii) the annual disbursement of HBFC loans shall be enhanced from the present Rs 1.2 billion to Rs 7.00 billion over the next 5 years
- (iv) simplification of procedures for land transactions and standardization of mortgage documents to facilitate sale and purchase of housing.
- (v) stamp duties and registration fees, which are exceptionally high as compared to other countries, shall be adequately reduced to an aggregate total of 1% to enhance registration, improve documentation and increase revenue receipts.
- (vi) property tax on rented property shall be reduced from the current high rate of 25% to 5%.
- (vii) all new construction of houses on plots measuring up to 150 sq.yds. & Flats/apartments having an area of 1000 sq.ft shall be exempt from all types of taxes for a period of 5 years.
- (viii) provincial governments shall develop packages in which prime state land within urban centers, occupied by the katchi abadies, shall be offered to the private developers for commercial use provided they arrange and finance up-gradating or

relocation of katchi abadies As a result of the coordinated efforts of Federal and Provincial Governments and concerned private sector stakeholders, a large number of policy measures have so far been implemented resulting in the improvement of overall housing situation in the country besides availability of affordable housing finance to the extent of Rs 34 billion in the market.

2.1.5 Environmental Overview

Sustainable development remains the cornerstone of government policies, and the concern for environment, its protection, renewal and enrichment is recognized as an obligation for the betterment of all citizens. The poverty environment nexus has been of particular interest in the recent years, as poverty in Pakistan, like in many other middle-income countries, plays an important role in increasing the vulnerability of the poor to pollution and environmental degradation.

Several policies, plans, programs and projects have been initiated for environmental protection and conservation in the areas of water and air pollution control, land use, forest management, energy efficiency, biodiversity conservation, and waste management, etc. One of the major achievements during 2005-06 was the formulation of the “National Environmental Policy 2005” which addresses the issues such as (a) water management and conservations, (b) energy efficiency and renewable energy, (c) agriculture and livestock, (d) forestry and plantation, (e) biodiversity and protected areas, (f) climate change, air quality and noise, and (g) pollution and waste management.

The key factors contributing to air pollution in Pakistan are: a) rapidly growing energy demand; b) increasing industrial and domestic demand and c) a fast growing transport sector. In the cities, widespread use of low-quality fuel, combined with a dramatic expansion in the number of vehicles on roads, has led to significant air pollution problems. Air pollution levels in Pakistan’s most populated cities are among the highest in the world, causing serious health issues in the process. The government is promoting the use of CNG in a big way to reduce the pollution level. Presently, some 935 CNG stations are operational through out the country, while another 200 are under construction.

As of April 2006, the total number of CNG vehicles stood at 950,000, compared to 700,000 vehicles in April 2005, making Pakistan’s CNG fleet the largest in Asia and the third largest in the world after Argentina and Brazil. Water availability in Pakistan continues to decrease, both in total amount of water as well as in the per capita water availability in Pakistan. In 1951, when population stood at 34 million, per capita availability of water was 5300 cubic meter, which has now decreased to 1105 cubic meter, just touching water scarcity level of 1000 cubic meter. With a present growth in population and the low rainfall, the threshold limit of water scarcity i.e. 1000 m³ of water per capita per year may be reached as early as the year 2010. Various mega initiatives have been planned especially under WAPDA vision 2025. The estimates show that the current water shortage of 9 million acre feet would aggravate to 25 MAF if all planned dams under Vision 2025 are not constructed by 2016.

The Government is committed to supply safe drinking water to its people and in this regard has started implementation of a “Clean Drinking Water Initiative” Project in 2005, which caters for the installation of 544 water purification plants of 2000 gallons/ hour capacity, one in each Tehsil of Pakistan. A new project on “Clean Drinking Water for All” under Khushal Pakistan

Program, has been recently approved and caters for installation of around 6035 water purification plants of different capacities (500/ 1000/ 2000 gallons/ hour), one in each union council of Pakistan. Like many other developing countries, dry lands in Pakistan are severely affected by land degradation and desertification due to unsustainable land management practices and increasing demand of natural resources causing enormous environmental problems. The situation is further aggravated by scarcity of water, frequent droughts and miss-management of land resources, contributing to expansion of deserts, reduced productivity and consequently increases in rural poverty. In order to address the problems of land degradation and desertification, the Ministry of Environment, Government of Pakistan has taken an initiative and designed a full-scale project on “Sustainable Land Management to Combat Desertification in Pakistan”. The project aims at combating desertification and improving land management practices to eradicate poverty in arid and semi-arid regions of Pakistan. Forestry sector plays an important role in soil conservation, water regulation for irrigation and power generation, reduction of sedimentation in water conveyances and reservoirs, employment and maintenance of ecological balance. Under the Millennium Development Goals of the Forestry Sector, Pakistan is committed to increase forest cover from existing 5 % to 5.7% by the year 2011 and to 6% by the year 2015. This implies bringing an additional 1.051 million hectares land area under forest.

The Government of Pakistan is implementing a number of Policies and programs in the Environment Sector. National Environment Action Plan (NEAP) remains the Flagship program of the Ministry of Environment. The main objectives of NEAP are to safeguard public health, promote sustainable livelihood and enhance quality of life for the people of Pakistan. It focuses on clean air, clean water, solid waste management and eco-system management.

2.2.1 Environmental Policy and General Legislative Framework

2.2.1.1 National environmental policy 2005 (NEP-2005)

The National Environment Policy provides an overarching framework for addressing the environmental issues facing –Pakistan, particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of biodiversity, desertification, natural disasters and climate change. It also gives directions for addressing the cross sector issues as well as the underlying causes of environmental degradation and meeting international obligations.

NEP-2005, while recognizing the goals and objective of the National Conservation Strategy, National Environment Action Plan and other existing environment related national policies, strategies and action plans, provides broad guidelines to the Federal Government, Provincial Governments, Federally Administrated Territories and Local Governments for addressing environmental concerns and ensuring effective management of their environmental resources. The Provincial, AJK, Northern Areas and Local, Governments, however, may devise their own strategies, plans and programs in pursuit of this Policy.

NEP-2005 **Goal** is to protect, conserve and restore Pakistan’s environment in order to improve the quality of life of the citizens through sustainable development.

NEP-2005 **Objectives** are:

- I. Conservation, restoration and efficient management of environmental resources

- II. Integration of environmental consideration in policy making and planning processes.
- III. Capacity building of government agencies and other stakeholders at all levels for better environment management
- IV. Meeting international obligation effectively in line with the national aspirations.
- V. Creation of a demand for environment through mass awareness and community mobilization

***<http://www.mofa.gov.pk/publications/overview.pdf>**

NEP-2005 provides **guidelines** for the sectors: water supply and management, air quality and noise, waste management, forestry, biodiversity and protected areas, climate change and ozone depletion, energy efficiency and renewable energy, agriculture and livestock, and multilateral environmental agreements. It also provides guidelines for the cross-sectors: environment- poverty, - population, - gender, -health, -trade, -local government and natural disaster management.

For achieving the objectives of NEP-2005, the following **policy instruments** are identified:

- Integration of environment into development planning
- Legislation and regulatory framework
- Capacity development
- Economic and market based instruments
- Public awareness and education

Public-Private-Civil Society Partnership

The National Environment - Policy envisages that:

- I. Federal, provincial and local governments would be encouraged to build strategic partnerships with private sector and civil society organizations for effective environmental management through creation of enabling environment.
- II. Public private partnership for expansion and improvement of environmental services such as potable water supply, sewage disposal, efficient transport and efficient energy production would be promoted.
- III. Sector specific advisory committees involving public, private and civil society organizations would be established.
- IV. The concept of participatory approaches and practices would be included in the curriculum of environmental education and training program.

Implementation and Monitoring

The Ministry of Environment is striving for implementation of NEP. All relevant Ministries, Departments and Agencies would also devise plans and programs to implement the policy provisions relating to their respective sector/ sub-sector. Similarly, the Provincial Governments, Federally Administrated Territories and local governments would also devise their own strategies, plans and programs for implementation of the Policy.

To ensure effective coordination of Policy implementation and oversee the progress in this regard, a National Environment Policy Implementation Committee established at the Federal level. The composition of the Committee is as follows:

- I. Secretary, Ministry of Environment (Chair)
 - II. Secretary, Planning and Development Division
 - III. Secretary, Ministry of Industries
 - IV. Secretary, Ministry of Finance
 - V. Secretary, Ministry of Food, Agriculture and Livestock
 - VI. Secretary, Ministry of Health
 - VII. Secretaries of Provincial/ AJK/NA Environment Department
 - VIII. Three representatives from the Corporate Sector/Chambers of Commerce and Industry
 - IX. Three representative from the Civil Society Organizations
 - X. Directors General (Environment), Ministry of Environment (Secretary/Member)
- “National Environment Policy Implementation Committee” would meet biannually. The Committee would report the status of implementation of the Policy to Pakistan Environmental Protection Council on regular basis.

An “Environment Policy Directorate” would be established in the Ministry of Environment to serve as the Secretariat to the Committee. All relevant Federal Ministries as well as Provincial Government’s would also create special cells to coordinate implementation of the Policy. Furthermore, Provincial, District and Tehsil Governments would also constitute “Policy Implementation Committees” in order to ensure coordinated implementation of the Policy through effective participation of all stakeholders, including corporate and civil society organizations.

2.2.1.2 General Legislative framework

In Pakistan there is Federal System of Government comprising of 4 provinces (Sindh, Punjab, NWFP and Balochistan) and other areas as defined in article 1 of the Constitution of the Islamic Republic of Pakistan, 1973. Amongst others these areas include the Federally administered Tribal Areas (FATA) and the Provincially administered Tribal Areas (PATA). Along with the North Eastern Frontier of Pakistan there is also the territory of Azad Jammu & Kashmir (AJK), which is for all intents and purposes under the administrative control of the Government of Pakistan.

Acts:

The federal laws are made by the Parliament i.e. National Assembly, Senate and the President. These laws are for the whole of the country and those dealing with foreign affairs. The procedure is detailed in articles 70 onwards of the Constitution of Pakistan. The subjects on which legislation can be done by the Parliament and Provincial Assemblies are contained in the Federal Legislative List and Concurrent Legislative List, in the fourth schedule to the Constitution. Legislation can be done on the matters contained on the concurrent list by either the National or Provincial Assemblies. However legislation on the matters not contained in either of the lists can be done only by the Provincial Assemblies.

Laws getting approval from the National Assembly are sent to the Senate for approval and then for approval by the President, where after they become the law of the land. The laws can also be initiated from the Senate wherefrom, they can be sent to the National Assembly and then to the President.

Laws getting approval from the Provincial Assembly are sent to the respective Governor of the province after whose assent it becomes the law of the province.

Ordinances:

When the National Assembly is not in session, the President of Pakistan can, under article 89 of the Constitution of Pakistan issue Ordinances. An Ordinance remains valid for a period of 4 months.

Rules:

These are the principles to which an action or procedure is intended to conform and are always framed in the exercise of power delegated under a statute.

Regulations:

These provide for specific measures required to put an act or ordinance into effect.

Article 247 of the Constitution of the Islamic Republic of Pakistan, 1973 gives the President and / or Provincial Government, the authority to make regulations “for the peace and good government” of the tribal areas.

Orders:

These may deal with a broad range of substantive issues such as the provincial constitutional order and legal framework order, or with a specific and limited situation as in the case of Environment Protection Orders that can be issued under the Pakistan Environmental Protection Act, 1997.

Administrative orders are issued by a designated authority in exercise of a delegated power to administer a particular issue. The status of an order depends on the delegated power under which it is issued.

Notifications:

These are not a separate class of legal instrument. They are the mechanism by which the executive branch of government promulgates rules and regulations. In certain cases, notifications also serve as a means to communicate specific official actions taken to accomplish a particular, limited purpose, such as designating a protected area.

Federal Shariat Court:

There is a Federal Shariat Court created under article 203/C of the Constitution of Pakistan. It has the exclusive jurisdiction to examine any law, whether it is against the principles of Islam or not. The court can declare any law to be against the injunctions of Islam and can give the government a deadline to make changes or enact new law, after which it ceases to be on the statute book

Powers of Superior Courts:

The superior courts i.e. High Courts and Supreme Court of Pakistan can declare any law to be ultra vires of the Constitution and strike down the same.

Money Bill:

A money bill goes only in the National Assembly, however through an amendment in the Constitution, now it goes to the Senate which sends its recommendations to the National Assembly for considerations before passing the same.

Conflict of Laws:

If there is any conflict between any provision of Constitution and any law or Ordinance, the provision of Constitution will prevail. Similarly if there is conflict between any rules / regulations and any law, the law will prevail.

Interpretation of Laws:

The Parliament has the exclusive jurisdiction for legislation and to make changes / amendments in existing laws, however it is for the superior courts to interpret laws.

Case Law:

The judgements of the Superior Courts of Pakistan are called case law or precedents. The High Court is the highest court in the province, decisions given by which can be challenged before the Supreme Court, which is the highest court in the country. A judgement given by a High Court is binding on all courts subordinate to it and a judgement of the Supreme Court is binding on all courts, tribunals and executive authorities throughout Pakistan.

2.2.2. Legislation and Regulations Addressing POPs Chemicals

Since 1860 laws have addressed certain aspects of the environment, such as measures against the fouling of public water or the protection of specific species. However, these laws were insufficient for environmental protection as a whole. The laws were either not enacted for the purpose of environmental protection and resource conservation, and their environmental content was ancillary. Other laws were narrowly focused on a selected aspect. Most lacked a proper definition of the environment, lacked measurable standards, implementation tools, were not backed up by adequate resources, and were punitive in character, while the prescribed fines were eroded by inflation. For the first time in Pakistan a constitutional provision relating to “Environmental Pollution and Ecology” was added as item 24 in the Concurrent Legislative List whereby both the Federal as well as the Provincial Legislature were authorized on the subject.

The first law formally designated as Environmental Law was the Pakistan Environmental Protection Ordinance, 1983.

A study was carried out in the early 90s when the National Conservation Strategy was formulated. This Strategy forms the basis of today's policies and laws relating to environment.

In 1997 the Pakistan Environmental Protection Act ("Act") received the assent of the Parliament with a comprehensive definition of environment and a Sustainable Development Fund for its implementation. This law provides the general framework for environmental legislation. Pakistan Environmental Protection Act 1997(PEPA-97) is a comprehensive document and provides for the protection, conservation, rehabilitation and improvement of the environment and promotion of sustainable development. The Act covers air, water, soil, noise pollution and hazardous waste.

PEPA-1997 section 11 prohibits any emissions or discharges in excess of national environmental quality standards (NEQS). Sections 13 and 14 specifically deal with the prohibition of imports of hazardous waste and handling of hazardous substances, respectively.

Other pieces of laws in Pakistan's legal and regulatory framework that governs the toxic and hazardous substances and wastes are "Hazardous Substances Rules-1999," "Import Trade and Procedures Order-2000," "Guidelines for Hazardous Waste Management in Pakistan," "The Explosive Act-1884," "The Factory Act-1934," "The Customs Act-1969" and "Pakistan Nuclear Safety and Radiation Protection Ordinance-1984."

2.2.2.1 POPs Pesticides

Agricultural Pesticides Ordinance, 1971

The only law having any significance with respect to POPs in Pakistan is the Agricultural Pesticides Ordinance, 1971. This law was promulgated in 1971 with the purpose of regulating the import, manufacture, formulation, sale, distribution and use of Pesticides in Pakistan. The provisions of this law are supposed to be applied parallel to other laws. Eight POPs are included in pesticides.

Agricultural Pesticides Rules, 1973

Pursuant to the above enactment, rules were made by the name of Agricultural Pesticides Rules, 1973. The rules give the detailed procedures for complying with the provisions of the main law. They contain provisions giving details of registration procedure, grounds for refusal to register. Certain pesticides including certain POPs are required to be labelled as POISON. Recently in January, 2004 rule 12-A was added which makes it incumbent upon the importers, manufacturers and formulators to themselves supervise the packing of pesticides. They are also required to certify that the pesticides are not on the negative list in the developed countries like those of the European Union, as well as other chemicals producing countries such as China and India. The penalty for violating provisions of this law range with imprisonment between 1 and 3 years and with fine up to Rs.500,000/-.

West Pakistan Agricultural Pests Ordinance, 1959

This law empowers the government to prohibit the employment of such methods of cultivation as help the spread of agricultural pests either generally or with respect to any particular crop.

This law was promulgated with the aim of preserving quality of land. However it serves a very useful purpose i.e. if the spreading of pests can be controlled then no pesticides whatsoever would be required.

West Pakistan Agricultural Pests Rules, 1960

These rules were made pursuant to above which make it obligatory on the owners of cultivated land to clear the land of all plant remains some time after harvesting of crops.

The Pakistan Plant Quarantine Act, 1976

Section 3 empowers the Federal Government to prohibit imports of articles that are likely to cause infection to any crop or plant.

The legal position of POPs Pesticides is depicted below:

		Nature of POP	Production Elimination	Use Elimination	Eliminate Imports	Eliminate Exports
1.	Aldrin	This is a pesticide	Production is governed by permission u/s 5 of the Agricultural Pesticides Ordinance, 1971. There is no production in Pakistan of the referred POP. There are no chances of its production as it was never allowed to be registered	Official Sale is governed by registration under section 11, 21, 21-A & 24 of the Ordinance and Rules 11-A, 13, 14. However use can be eliminated by applying section 5 of the Pure Food Ordinance and Rule 11 thereof, section 141, Fourth Schedule, Part I of the Local Government Ordinance. Section 14 of the Environmental Protection Act, 1997 is also relevant	Import prohibition is governed by Sec. 9 of the Pesticides Ord. Furthermore it can be banned under section 15 of the Customs Act, 1969. The misdeclaration can be controlled under sections 79 & 80 of the said law. However there are no adequate safeguards to avoid bypassing of these provisions	There is no provision in the Pesticides law dealing with export of Aldrin, however, the same can be restricted under section 15 of the Customs Act, 1969. There are no chances of its export as it is neither imported nor produced in Pakistan
2.	Chlordane	This is a pesticide	Production is governed by permission u/s 5 of the Agricultural Pesticides Ordinance, 1971. There is no production in Pakistan of the referred POP. There are no chances of its	-Ditto-	-Ditto-	-Ditto-

		Nature of POP	Production Elimination	Use Elimination	Eliminate Imports	Eliminate Exports
			production as it was never allowed to be registered			
3.	Dieldrin	This is a pesticide	Production is governed by permission u/s 5 of the Agricultural Pesticides Ordinance, 1971. There is no production in Pakistan of the referred POP. There are no chances of its production as it was deregistered since 1983	-Ditto-	-Ditto-	-Ditto-
4.	Endrin	This is a pesticide	Production is governed by permission u/s 5 of the Agricultural Pesticides Ordinance, 1971. There is no production in Pakistan of the referred POP. There are no chances of its production as it has been deregistered since 1985	-Ditto-	-Ditto-	-Ditto-
5.	Haptachlor	This is a pesticide	Production is governed by permission u/s 5 of the Agricultural Pesticides Ordinance, 1971. There is no production in Pakistan of the referred POP. There are no chances	-Ditto-	-Ditto-	-Ditto-

		Nature of POP	Production Elimination	Use Elimination	Eliminate Imports	Eliminate Exports
6.	Hexachlorobenzene (HCB)	This is a pesticide	of its production as it has been deregistered since 1997.			
			Production is governed by permission u/s 5 of the Agricultural Pesticides Ordinance, 1971. There is no production in Pakistan of the referred POP. There are no chances of its production as it has been deregistered since 1996.	Official Sale is governed by registration under section 11, 21, 21-A & 24 of the Ordinance and Rules 11-A, 13, 14. However use can be eliminated by applying section 5 of the Pure Food Ordinance and Rule 11 thereof, section 141, Fourth Schedule, Part I of the Local Government Ordinance. Section 14 of the Environmental Protection Act, 1997 is also relevant	Import prohibition is governed by Sec. 9 of the Pesticides Ord. Furthermore it can be banned under section 15 of the Customs Act, 1969. The misdeclaration can be controlled under sections 79 & 80 of the said law. However there are no adequate safeguards to avoid bypassing of these provisions	There is no provision in the Pesticides law dealing with export of Aldrin, however, the same can be restricted under section 15 of the Customs Act, 1969. There are no chances of its export as it is neither imported nor produced in Pakistan

2.2.2.2 Industrial POPs - Polychlorinated Biphenyls (PCBs)

The production, supply & use of PCBs is not specifically regulated in any way in Pakistan. Sections 13 & 14 of Pakistan Environmental Protection Act.1997 (PEPA-97) deal, in general, with prohibition of import of hazardous wastes & handling of hazardous substances. PEPA-1997, Section 11 prohibits discharges/emissions into environment above National Environmental Quality Standards (NEQS). However, PCBs have not been specifically included in the list of NEQS but as “Phenolic Compounds.” Under the recently introduced “Self-Monitoring and Reporting/SMART ” program for industry in the country, only petrochemicals, petroleum, oil & gas, tanning and leather finishing industries are required to periodically report “Phenolic Compounds” levels (measured as phenol) in their industrial liquid discharges/ effluents. PCBs are not given as “Banned Items” (Negative List) or “Restricted Items” in the “Import Trade and Procedures Order, 2000.” Nor are PCBs mentioned in “Hazardous Substances Rules 1999.”

There is no specific law on polychlorinated biphenyls (PCBs).

Due to the adverse health and environmental impacts caused by PCBs, it is essential that PCBs specific regulations for its complete phase out be developed and implemented in the country. The following action are proposed for strengthening the Legislation on PCBs :

- Ban on export or import of PCBs.
- Law on the phasing out of PCB containing transformers.
- Ban on recovery for the purpose of re-use in other transformers of liquids with PCB contents above 0.005%
- Law on examination of PCB polluted areas and electrical equipment.
- Law on the requirement on cleaning PCB polluted areas.
- Law on establishment of special facilities for destruction of PCB and PCB containing substances and wastes.
- Law on requirements on collection and transportation of PCB and PCB-containing wastes.
- Law on requirements on labeling/ marking of existing PCB containing transformers.

2.2.2.3 Unintentional Persistent Organic Pollutants (U-POPs)

There is no specific law on unintentional POPs, such as dioxins (PCDDs) and furans (PCDFs).

There is a need, now to identify the short-comings in such laws that can be remedied to bring them in accordance with the Stockholm Convention on Persistent Organic Pollutants (POPs).

2.3 Assessment of the POPs Issues in Pakistan

POPs are highly toxic chemicals causing an array of adverse effects, notably death, disease and birth defects among humans and animals. Certain POPs have been associated with cancers and tumours at multiple sites; neuro behavioural impairment including learning disorders; immune system changes; reproductive defects of exposed individuals as well as their offsprings; and diseases such as endometriosis, increased incidence of diabetes and others. Assessment of POPs issues in Pakistan, such as status of POPs based on national inventories, stockpiles of pesticides and industrial chemicals, their disposal, environmental and health impacts due to releases of unintended POPs are described and discussed in the following pages.

2.3.1 Assessment of POPs- Pesticides issue in Pakistan

Agriculture is the main economic sector where chlorinated pesticides have been used, the effects of which are felt nowadays. These effects are not “proven” because there is no substantial research oriented in the direction of verifying the effect of past pesticide use in agriculture. The impact of pesticides used in agriculture on water is in the form of diffuse pollution and is actually measured in the underground and surface waters nowadays¹⁻³.

¹ Javed A. Bhali et al, “Cytogenetic analyses of Pakistani individuals occupationally exposed to pesticides in a pesticide production industry,” *Mutagenesis*, vol.21, No(2), pp 143-148(2006-10-12)

2. Tahir Hasnain, “Pesticides use and its impacts on crop ecologies: Issues and Options,” Working Paper Series #. 42 Sustainable Development Policy Institute, Islamabad, Pakistan (1999)

3. Mahmood A. Khwaja, M.Rasool Jan and Kashif Gul, “Physical verification and study of contamination of soil and water in and surrounding areas of abandoned POP (DDT) factory in NWFP, Pakistan, Institute of Chemical Sciences, Peshawar University and SDPI (2006)

Naila Hussain, “Poisoned Lives: The Effects of Cotton Pesticides,” Shirkat Gah, Lahore (1999)

Various methods were used in the course of conducting an inventory including review of previous reports, physical visits of stores, shops, and also data were taken from dealers. The criteria used to identify regions and sites to be visited included high concentration of business and agricultural activities, reports of the previous inventories of obsolete pesticides. Furthermore, those institutions and offices involved in the cycles of POP Pesticides' use, control and management were consulted.

The pesticides stored in the deposits inventoried are in solid and liquid forms and a part of them are substances that are not identified. These deposits are potential sources for accidental pollution as well, (especially, those deposits which are under improper safety conditions).

The existing POP-pesticides stocks (including wastes) have been inventorised for the years 2004, 2005. In Punjab a total of 167 stock piles have been reported which contain 3800 tons of POPs pesticides. In Sindh, 2016 tons of POPs pesticides are reported. The biggest dump was reported to be in Provincial Store, located in Malir city, Karachi that contained about 400 tons of obsolete pesticides; however Hyderabad holds largest stock pile of POP pesticides. At present, Karachi store site has been converted into court rooms and Divisional Store Hyderabad storage site that contained more than 100 tons of POP pesticide was proposed for a girl's college. There was no official records/information on shifting or proper disposal of the obsolete pesticides from the stores. In NWFP, presence of Dieldrin is reported in the custody of Agriculture Officer Nawagai Circle Store, contained in two iron drums about 25 km away from Daggar. No identification mark is present on the containers and is stored with other pesticides and seeds. No stocks were reported with the private dealers due to the strict Government action and negligible use of pesticide in the area. In Balochistan, the presence of large quantity of the POPs pesticides has been reported in the stores of the public sector Departments at Quetta. The stock piles mainly contain Eldrin, Dieldrin, Endrin, Heptaclor, Chlordane and BHC. However, few small quantities of BHC & Dieldrin are reported at Loralai, Ziarat and Dera Murad Jamali. The exact quantity of the B.H.C has not been measured as it is very difficult to do so due to poor storage conditions. DI Khan District works as transportation route of POPs pesticides smuggled items from Iran via tribal areas through Afghanistan due to its geographical location. In Azad Jammu and Kashmir (AJK) 31.5MT and in the Northern areas 0.5MT of POPs pesticides have been reported.

Pakistan Agricultural Pesticides Association (PAPA) in collaboration with the multinational companies is making efforts to monitor the pesticide resistance. Integrated Pest Management (IPM) funded by FAO and ADB is promoted for pest control of cotton, sugarcane, apple and mango. Control of fruit flies, scale insects and bollworms has been successfully achieved.

3. Mehmood A. Khawaja, M. Rasool Jan and Kashif Gul, "Physical verification and study of contamination of soil and water in and surrounding areas of abandoned POPs (DDT) factory in NWFP, Pakistan, Institute of Chemical Sciences, Peshawar University and SDPI (2006)

Naila Hussain, "Poisoned Lives: The Effects of Cotton Pesticides, "Shirkat Gah, Lahore (1999).

2.3.1.1 Identified Stockpiles of POPs Pesticides and Waste

There are approximately 6033 MT of obsolete stocks of POPs pesticides (3800 MT Punjab, 2016 MT Sindh, 48 MT NWFP, 135 MT Balochistan, 31.5 MT AJK and 0.5 MT Northern areas). Large stocks of obsolete pesticides are situated in areas of intensive cash crops/ agricultural activities.

Since stockpiles are located in towns or villages and near water bodies, there are potential human health and environmental risks. However, there is no assessment that has been done to ascertain the health and environmental impacts associated with the stockpiles.

During the survey, it was observed that the magnitude of contamination of some obsolete POP Pesticides storage sites posing potential human health and environmental risks needs urgent remedial measures. Some of the identified gaps include limited capacity and experiences in monitoring of POPs releases, assessment of effects to human health and the environment and management of wastes. In addition, the existing legal framework does not articulate the liability as far as POPs waste disposal is concerned and there is poor documentation system both in the private and government offices during importation, formulation and distribution of POP Pesticides.

2.3.1.2 Import and Export of POPs Pesticides

The survey revealed that Pakistan used to import POP Pesticides from different countries for various uses. Due to poor documentation of information, it was not possible to establish amounts, and it is evident that huge amounts of POP Pesticides were imported above actual needs. The magnitude of the problem can be estimated retrospectively with reference to the presence of obsolete stockpile of POP Pesticides at present.

The Plant Protection Regulations declare the points of entry for the importation and exportation of pesticides into/out of Pakistan. These include airports, harbors and overland border entry points. In most of these border posts, there are both custom officers and plant protection inspectors. Pesticides consignments passing through entry points are subject for constant checks by customs officers.

The importation and exportation of POP Pesticides involves competent authorities, importers, exporters, registrants, sellers and end-users. The main responsibility of competent authority, which is the Ministry responsible for Agriculture, is to ensure proper adherence to regulations during importation, distribution and exportation. The registrants are required to follow procedures stipulated in the Plant Protection Act during importation of pesticides. There is inadequate enforcement of the Plant Protection Act and its Regulations which needs to be strengthened.

2.3.1.3 Existing Programs and Infrastructure for Pesticides Assessment and Management

There are several **gaps** with regard to POPs-pesticides management in the country. These include:- inadequate policies and legislation to govern POPs-pesticides management, monitoring, search for suitable alternatives, liability for POPs waste disposal and remediation of sites contaminated with POPs, public information dissemination, education and awareness.

There are no guidelines to guide POPs waste management and remediation of POPs contaminated sites. There is weak enforcement of the existing legislation relevant to POPs management. In addition, there is inadequate capacity and experience for tracking human and environmental effects caused by POPs and their alternatives; management of such effects is not known yet. Few institutions have laboratory facilities and trained personnel that can facilitate monitoring of POPs and their alternatives, although these need strengthening in terms of specialized training and upgrading of equipment. Other deficiencies include: limited researches on alternatives of intentionally produced POPs, poor documentation system of POPs information both

in the private and government institutions and lack of awareness at all levels. Also there is lack of planned information dissemination strategy to inform the public on POPs issues and weak mechanism to facilitate coordination and reporting on POPs issues.

Sellers of pesticides are certified for their competence. It is a requirement of the Plant Protection Act that retailers and whole sellers must possess the necessary specialized knowledge before being certified in order to minimize harmful effects on the health of humans, animals and the natural environment. Qualified retailers and whole sellers entail ability for self-protection and guarantee for the dissemination of appropriate information to end users on safe use and handling of pesticides. The sellers are required by law to sell registered and approved pesticides only.

The role of **end users** is to ensure that pesticides are handled and used in accordance with the instructions on the labels. Involvement of end users in pesticide management is still low and also there is low awareness among farmers on dangers of pesticides. Outreach programmes should be strengthened.

2.3.2 Assessment of Polychlorinated Biphenyls (PCBs) issue in Pakistan

The Polychlorinated biphenyls (PCBs) are established “Hazardous Chemicals” for human, plant and marine life. Once in wildlife and human organisms, PCBs cause disastrous effects. Organisms become less fertile, less immune, slower, have lower IQ’s and have higher rates of cancer. The PCB problem is an environmental problem and is not limited or confined to a specific area or population. There are many activities that produce PCBs wastes. Industrial, automotive and electric machinery are the main sources of PCBs contaminated oils. Lakes, rivers and the sea contain PCBs due to industrial discharges where they absorb into sediments. Repair and decommissioning of PCBs containing equipment, building demolition (from closed, partially closed and open applications), PCBs leaching from landfills and incinerators. Inadvertently, PCBs laden materials are also produced through a number of chemical processes in the organic pigments, pesticides, chemical and aluminium refining industries.

Human populations have been exposed to PCBs via accidental, occupational and environmental pathways. However, the ingestion of food, particularly meat, fish, and poultry is considered to be the main path of exposure. Occupational exposure may occur via skin absorption and inhalation. Worldwide exposure has led to conditions such as skin rashes, itching and burning, eye irritation, skin and fingernail pigmentation changes, disturbances in the liver function and immune system, irritation of the respiratory tract, headaches, dizziness, depression, memory loss, nervousness, fatigue, and impotence. Chronic effects of low-level exposure include liver damage, reproductive and developmental effects and possibly cancer. Other health effects include immune dysfunction, neurological and behavioural abnormalities and reproductive disorders.

The problem existed in Pakistan but unfortunately remained ignored until Pakistan signed the Stockholm Convention on POPs. Article 3 of the convention on POPs describes the measures to reduce or eliminate releases from intentional production and use of POPs and states that each state shall (a) prohibit and /or take the legal measures necessary to eliminate (i) production and use of the chemicals listed in Annex A (which includes PCBs) and (ii) their import and export. Specific measures to reduce/eliminate PCBs are described in Part 2 of Annex A, binding each state to make determined efforts to identify, label and remove from use, equipment containing (i) greater than 10% PCBs and volume greater than 5 liters (ii) greater than 0.05% PCBs and volume greater than 5 litres and (iii) greater than 0.005% PCBs and volume greater than 0.05 litres.

2.3.2.1. PCBs Problem in Pakistan

Persistent Organic Pollutants (POPs) problem including PCBs, has not been a priority environmental issue in Pakistan. In the National Environmental Action Plan (NEAP) approved by Pakistan Environmental Protection Council (PEPC) in 2001, the given four areas of immediate concerns are clean air, clean water, disposal of solid wastes and eco-system management. Toxic and hazardous substances, including PCBs, are one of the additional areas of concerns of NEAP. Whereas there has been some awareness raising among farmers with regard to health impacts of excessive and unsafe pesticides use and some published data is available on residual pesticides in food and in human blood, little information in any form is available on PCBs.

Data Collection

In Pakistan little information is available in any form on PCBs containing electrical equipment, use and wastes. To collect information and data for assessing PCBs situation in the country, site visits, including repairing/recycling workshops, preliminary surveys using a questionnaire, telephonic contacts and meetings were undertaken with different stakeholders including government/WAPDA officials, electronic equipment suppliers/store managers and manufacturers.

2.3.2.2 Transformers and Transformer Oils in Use

Of many uses/ applications of PCBs in other parts of the world, in Pakistan the main use seems to be in different PCBs formulations, generally termed as “Transformer Oil,” used in power and distribution transformers for cooling and insulation purposes. Sealed or compact transformers with capacity of 10 - 20 MVA, power transformers of 20/26 & 10/13 MVA (average life of 8 – 10 years) and mostly locally manufactured are in use. WAPDA employs distribution transformers of 10, 15, 25, 50, 100, 200 KVA. However, in the private sector 400, 600 and 730 KVA capacity distribution transformers are also in use. For transformer installation both the Pole & Pad systems are in practice. Among the damaged transformers received at the repairing/recycling workshops the number of Pole transformers has been reported to be higher than the Pad transformers and hence the former type are more likely source of PCBs releases into the environment. Generally, employing a large number of small size transformers within small areas has been preferred over employing small number of big size transformers in large areas. Whereas, both these system have their merits & demerits in terms of cost, consumers’ convenience, installation, maintenance & supervision, both may be as environment unfriendly due to possible PCBs releases. Leading transformers manufacturing companies in the country are ALIMITAC, PEL, TRANSFEB, SIEMENS, Climax, and Heavy Electrical Complex, Taxila. In the past, transformers have also been imported from ex-Soviet Union, Romania, China, Bulgaria, Iran and Germany^{4,5}

It has been established through monitoring and survey that PCB contaminated oils, equipments and soils exist at different sites in Pakistan. The initial survey reports from Sindh, Punjab and NWFP have indicated that about 80% of the samples tested in the provinces had PCB levels higher than the safe limits (> than 50 ppm). Due to lack of facilities or working personal, the testing of the PCBs suspected materials/equipments could not be done in Balochistan. It is

⁴ Mahmood A. Khwaja and Jan Glavin, “Environmental and health impacts of PCBs and measures for PCBs phase out in Pakistan,” Science, Technology and Development 2006 (submitted.)

5. Provincial POPs inventories, Pak-EPA/UNDP, Islamabad, Pakistan (2006)

likely that the PCB oil contaminated equipment and soil may exist at all those areas used for electricity generation or distribution purposes.

The data about the number of transformers installed by WAPDA till 30-04-2006 and quantity of oil in transformers is given in Tables 2.3.2.2.1 and 2.3.2.2.2 - 3 respectively, which do not include transformers employed in private sector (**for further details refer annexes**). The described data also does not include the un-serviceable transformers and equipments, stored or left in open in different depot across the country for auction⁴⁻⁵

Table 2.3.2.2.1: Transformers installed as on 30-04-2006

Companies	KVA										Total	
	25	50	75	100	150	200	250	400	630	Other	NOS	MVAs
LESCO	22978	12856	423	8873	42	6675	5	553	411	5601	58417	4386
GEPCO	17417	10507	163	5226	25	2621	5	141	150	354	36509	2250
FESCO	25598	14247	507	7001	12	3583	6	330	292	3898	55574	3369
IESCO	7023	9817	85	6128	30	4550	39	218	216	1514	29620	2628
MEPCO	47884	19690	148	5481	97	2564	0	906	545	4015	81330	4122
PESCO	12792	14496	70	8134	42	2375	28	164	245	450	38796	2703
TESCO	1182	2796	0	1949	0	335	0	3	5	0	6270	436
HESCO	21369	13062	1	4800	7	2188	15	209	184	3573	45308	2875
QESCO	9436	10533	16	3563	0	729	1	42	53	45	24418	1369
KESCO	--	--	--	--	--	--	--	--	--	--	95,074	--
Total	165679	108004	1413	51155	255	25620	99	2566	2101	19450	471316	24129

Source; WAPDA House Transformer Div. Lahore (2006)

-
4. Mahmood A. Khawaja and Jan Glavin, "Environmental and health impacts of PCBs and measures for PCBs phase out in Pakistan," Science, Technology and Development 2006 (submitted)
 5. Provincial POPs inventories, Pak-EPA/UNDP, Islamabad, Pakistan (2006)

Table 2.3.2.2. Transformer Oil (kgs)

COMPANIES	TRANSFORMERS (KVA)										TOTAL
	25	50	75	100	150	200	250	400	630	others	
LESCO	1470592	1247032	50760	1277712	8400	1602000	1400	165230	266325	3864690	6476144
GEPCO	1114688	1019179	16310	73164	1200	629040	1400	43710	97200	244260	3240174
FESCO	1638272	1381959	60840	1008144	2400	849120	1680	102300	189216	2689620	7923551
IESCO	449472	952249	10260	882432	6000	1092000	10920	67580	139968	1044660	4655541
MEPCO	3064576	1618930	17760	789264	19400	615360	0	280860	353160	2770350	9529660
PESCO	818688	1406112	8400	1171296	8400	570000	7840	50840	158760	310500	4510836
TESCO	75648	271212		280656		80400		930	3240	0	712086
HESCO	1367616	1267014	20	691200	400	525120	200	64790	119232	2465370	6506062
QESCO	603904	1021701	920	513072		174960	80	13020	34344	31050	2394251
KESCO	-	-		-		-		-	-	-	120000
Grand Total											82.89 MKg

Source: PEL, Lahore (2006)

Table: 2.3.2.2.3
Quantity (kg) of Oil in Transformers (KVA)
(As on 30 04-2006)

KVA	25	50	75	100	150	200	250	400	630
KG	64	97	120	144	200	240	280	310	648

Source: PEL Lahore (2006)

Total Transformers installed	471316
Total Oil in Transformers	82.89MKg
No of Damaged transformers	376242
Oil in damaged transformers	66.14MKg
WAPDA Purchased transformer oil in 2005	7200 tons

(Source; PEL, Lahore. 2006)

An on-going sampling and testing program needs to be established for the presence of PCBs in the transformer oil.

Transformer oils are used for the multiple roles of dielectric, heat transfer agent and arc- quencher. Both paraffin and mineral based transformer oils have been/are being used in the country, probably containing some PCBs. The oil content in 15, 100 and 200 KVA capacity transformers as declared on the transformer label was found to be 48.5, 114 – 152 and 198.5 kg, respectively. However, different volumes of oil are used in distribution transformers according to their voltage rating and range from 40 litres in 10 KVA to 270 litres in 200 KVA. Reported synthetic oils which have been/are being used include Silicon, Ester & Askarel. The transformer oil has also been imported in the country from China, Germany, Romania, Russia, Czech Republic and USA. Pak-HY Oils Limited is one of the main suppliers of transformer oil to WAPDA. It is claimed that Pak-HY Oils Limited has been producing PCBs free oil from the mineral based feedstock for the past 25 years. However, the oil containers at different WAPDA storehouses are not labelled, “PCBs Free” or “NO PCBs” by the company^{3,4}.

Askarels synthetic transformer oils are considered to be the main source of PCBs release and their use has been prohibited in many countries, including Pakistan. However, it could not be ascertained by which government department and since when the use was prohibited in Pakistan. The reclaimed Askarels from discarded old transformers could still be a source of PCBs release to the environment. Even if the PCBs free transformer oil has been in use in the country for quite some time, PCBs contamination of in-service transformer oil may have occurred due to use of reclaimed Askarels oils (from old/discarded transformers) in transformer oil reprocessing (refilling, oil level top up).

2.3.2.3 Repair, Recycling, and Reclamation

During meetings/site visits, investigators were informed that only physical damage may cause any leakage/release of the oil to the environment. The largest source of contamination from PCBs with reference to capacitors and transformers is when these are either old or have leaked. Transformer repair workshops therefore are potential sources of PCBs contamination, affecting workers and wildlife. There are repairing workshops in some main cities (Lahore, Hyderabad, Sukker, Nowshera, Islamabad, Peshawar & other towns) in the country with facilities for recycling (dehydration followed by filtration) of transformer oil contaminated with moisture/impurities. The drainage water and soil messed up with some oily stuff was observed all around the workshop near WAPDA Field Store, Defence Colony, Peshawar. Damaged distribution transformers are generally not recycled but disposed off, whereas power transformers are preferably recycled. A repair/recycling workshop may receive as many as 250 damaged transformers in a year. The disposed off damaged pole transformers may range between 40 – 60 per annum.

Damaged transformers, if un-repairable are auctioned by WAPDA from time to time. These discarded transformers are dismantled and different parts are used to reassemble transformers or the scrap is sold to steel mills. The unused oil from the dismantled transformers is sold to small scale welding plants and industries. We were informed that the carbonized discarded transformer oil is also reported to be used by elderly village people as remedy for joints-pain and is supplied to them free of cost in small quantities by repair/recycling workshops^{3,4}.

The transformers in Pakistan have not been operating without fault and there has been a reported case of five WAPDA officials sustaining burn injuries at the Saidpur Grid Station in Lahore due to bursting of a transformer because of some technical fault. Transformers are damaged due to overload, manufacturer fault, and loose connection or short-circuiting inside the transformer. Besides the transformer installation sites in the country, the other potential sites of PCBs releases into the environment could be oil reclamation plants, repair and maintenance workshops, vendors workshops, welding plants, small industries, furnaces and ship-yards^{3,4}.

2.3.3 Assessment of Unintentional Persistent Organic Pollutants (U-POPs)

Dioxins and Furans, which are among the twelve Persistent Organic Pollutants (POPs), of the Stockholm Convention are unintentionally generated and are commonly known as by products. Dioxins and Furans are environmental contaminants detectable in almost all segments of the global ecosystem in trace amount. Unlike other POPs, they have never been commercially produced and have never served any useful purpose, except as standards for laboratory analyses. Being produced as unwanted products in a wide range of industrial and combustion processes, it is not possible to eliminate them by prohibition of production and use. Indirect measures have to be taken to reduce the emission of Dioxins (PCDDs) and Furans (PCDFs) into the environment and to minimize human exposure. (Note HCB and PCBs may also be produced unintentionally).

Reliable data regarding levels of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzo-furans (PCDFs) are not available because adequate laboratory facilities are not available in the country for quantified analysis.

- Stockholm Convention on POPs requires that each party shall at a minimum take necessary measures to reduce the total releases from anthropogenic sources of each of the chemicals (PCDDs, PCDFs, HCB & PCBs) listed in Annex C (of the Convention), with the goal of their continuing minimization and, where feasible, ultimate elimination⁵

Convention lists 20 source types that have potential for formation and release of unintentionally produced POPs to environment [Annex C Parts II & III].

There is a need to prioritize options for implementation of BAT and BEP for potential unintentionally produced POPs to environment from different sources for all the four provinces in the country⁶.

2.3.3.1 Unintentional POPs Problem in Pakistan

Only a very few **studies on un-intentional POPs** (PCDDs & PCDFs) emission and resulting environmental and health impacts have been carried out in Pakistan. A recent study of free range chicken eggs from 20 localities in 17 countries (including Pakistan) on the five continents has indicated high levels of contamination with dioxins and PCBs⁶⁻⁸.

In Pakistan, the study was jointly carried out by IPEN participating organizations, ARNIKA, a Czech NGO and Sustainable Development Policy Institute (SDPI), Pakistan, in collaboration with Pakistan Environmental Protection Agency (Pak-EPA), to support the “POPs Enabling Activity Project” for the National Implementation Plan (NIP).⁷ The free-range chicken egg samples were collected from the households nearby the old abandoned municipal and hospital waste dumpsite along Charsadda road on the outskirts of Peshawar city. The analytical data obtained from this study indicated the presence of dioxins/furans (PCDD/Fs), PCBs, and HCB chemicals in the egg samples collected from the households nearby the dumpsite in the outskirts of Peshawar city. The level of PCDD/Fs (2.85- 2.91 World Health Organization WHO Toxic Equivalent, Picogram per gram egg fat, WHO-TEQ pg/g) was found to be close to the limit (3.0 WHO-TEQ pg/g) set by the European Union (EU). However, these observed levels are much higher compared to the eggs samples from Australia, North America and some European countries. Further, eggs sampled from similar sites in Kenya and Senegal showed much higher levels; 22.92 and 35.10 WHO-TEQ pg/g, respectively. PCBs & HCB pollutants levels (0.80 WHO-TEQ pg/g and 1.1 nanogram per gm egg fat, respectively) in eggs samples from the dumpsite in Peshawar were found to be lower than Czech Republic (5.0 WHO-TEQ pg/g) and EU (200 nanogram per gram) limits.

The above study represents the first report of dioxins/furans in chicken eggs or any other food item in general in Pakistan. These results, indicating the presence of toxic chemicals, especially high level of PCDD/Fs in the samples of chicken eggs from nearby the dumpsite on the outskirts of Peshawar are alarming. These persistent chemicals, even in very small dozes, are known to cause serious health problems such as cancer, reduced immunity, nervous system disorder, miscarriages, birth deformity & child development.

Waste incinerators, including municipal waste incinerators are considered among the most significant U-POPs sources. In another recent Arnika, Czech Republic & SDPI joint study carried out in Pakistan, U-POPs releases in ash samples from hospital waste incinerators and brick kiln has been examined and the data has been compared with U-POPs releases from incinerators in

⁶ Stockholm convention on persistent organic pollutants (POPs), UNEP, 2001

⁷ J.Digangi and J.Petrlik, “The Egg Report,” www.ipen.org International POPs Elimination Network (IPEN), USA (2005)

⁸ Mahmood A. Khwaja and J.Petrlik, “Study on contamination of chicken eggs by POPs in Peshawar, NWFP, Pakistan,” Arnika, Czech Republic and SDPI, Islamabad, Pakistan (April 2005)

Czech Republic and other countries⁸. In all ash samples studied, dioxins were detected at levels above LOD (level of detection) with exception of ash samples from PIMS, Islamabad, where four PCDD congeners and two PCDF congeners, among all normally measured 17 PCDD/Fs congeners, were not detected. Dioxins in ash from four medical waste incinerators were observed at levels ranging from 50.57 up to 2,290.30 pg I-TEQ/g d.m. Dioxin-like PCBs were observed in levels 0.12 up to 146.45 pg I-TEQ/g d.m. Seven PCB congener levels ranged from 1.07 up to 5.93 ng/g d.m. Levels of dioxins and dioxin-like PCBs in pg WHO-TEQ/g d.m. range from 50.56 up to 2,659.46 WHO-TEQ with dioxin-like PCBs contribution from 0.01 to 5.80 %. Seven PCBs congeners (PCB 28, 52, 101, 118, 138, 153 and 180) were found in samples of ash with levels:LRD Hospital - 2.46 (5.04) ng/g d.m., PIMS - 3.73 (4.46) ng/g d.m., Queta Hospital - 1.07 (3.81) ng/g d.m., Al Shifa Hospital 5.93 (7.51) ng/g d.m. and brick kiln in Ahmad Khel 4.38 (5.07) ng/g d.m.(levels in brackets are maximum values)⁹.

Since the incineration residues are not properly disposed off and are mostly dumped in the open, the threats to human health and environment, due to most hazardous nature of U-POPs these chemicals, are very likely.

The chemical analyses for the above two studies on eggs & ash samples were carried out in Czech Republic laboratories, as adequate facilities for PCDDs & PCDFs are not available in Pakistan.

2.3.2.2 Dioxins and Furans Sources (Provinces & Capital Territory Area)

The UNEP “Standardized Tool Kit for Identification and Quantification of Dioxins and Furans Release” was used to estimate these chemicals.

Table 1: Dioxin and Furan Sources by different Provinces and CTA (g TEQ/year)

Sources	Punjab	Sindh	NWFP	Baloch.	CTA	Pakistan
Waste Incineration	3041.056	2.027	3.594	0.204	3.757	3050.638
Ferrous & Non-Ferr. Metal Prod.	94.6756	1990.264	4.635	32.216	1.736	2123.527
Power Generation and Heating	237.43	3.911	23.741	0.107	0.301	265.49
Production of Mineral Products	28.581	0.428	2101.593	1.206	2188.533	4320.341
Transportation	2.251	0.002	0.548	0.115	0.548	3.464
Uncontrolled Combustion Process	2289.46	1557.457	939.576	51.1	51.1	4888.693
Product. of Chem. & Consumer Goods	1098.029	13737.1	127.11	0	0.006	14962.24

⁹ Mahmood A. Khwaja and J.Petrlik, “ Study of POPs in different samples of hospital waste incineration and brick kilns residues in Pakistan,” Arnika, Czech Republic and SDPI, Islamabad, Pakistan (May 2006)

Miscellaneous	0.001	36	0	0	0	36.001
Disposal/Land filling	18.043	0	0	0	0	18.043
Identifi. of Potential Hot-spots	0	0	0	0	0	0
Total	6809.527	17327.19	3200.797	84.948	2245.981	29668.44

Source: POPs inventory reports

Note: Zero value indicates insignificant TEQ value on calculation but not the null value.

From the Provincial as well as Federal Dioxin and Furan inventories reports, estimated the total emissions Dioxin and Furan (PCDD and PCDF) were 29668.44 g Toxic Equivalent (TEQ)/year during 2003. Sindh province released maximum amount of Dioxin and Furan, followed by Punjab, NWFP, CTA, and Balochistan amounting 17327.19, 6809.527, 3200.797, and 84.948 g Toxic Equivalent (TEQ)/year during 1993, respectively (**for details refer to annexes**)

2.3.4. Present Management of POPs, Current Capacity and Experience

Due to insufficient trained staff, lack of field testing equipment and disposal facilities, the management of POPs is weak in the country. Analytical laboratories in the country lack facilities for analyses of all POPs chemicals. There is also limited capacity, technical know how and experience in monitoring of POPs releases, exposure, assessment of environmental and health impacts and management of wastes.

2.3.5. Public Information, Awareness and Education

The survey by POPs Enabling Activity Project assessed the current national capacity to deal with issues of public information, education and awareness on POPs in accordance with Article 10 of the Stockholm Convention. This covered identification of mechanisms and tools available for the promotion of public information generation and dissemination and the educational and awareness programs.

The survey revealed that there are several policy and legal instruments that promote public awareness and involvement in environmental protection issues. Several initiatives that demonstrated active public involvement were identified. Several information dissemination pathways exist that could be utilized for dissemination of POPs information. Some of these include print media, radio; television; seminars/workshops/meetings; school curricula; and Environmental Clubs.

Some of the identified gaps include:- lack of database on POPs; weak information dissemination infrastructure; very limited awareness on POPs issue by key actors and the general public; lack of awareness programs specifically for POPs; inadequate capacity and experience to manage and monitor releases of POPs into the environment; lack of POPs management guidelines; and limited information on the available BATs/BEPs to minimize releases of POPs.

In view of the existing gaps, capacity building in information generation, storage, management and dissemination is very important for successful implementation of the Stockholm Convention.

2.3.6 Relevant Activities of Non-Governmental Stakeholders

A number of non-governmental organizations are working for awareness-raising of public on environmental pollution issues and resulting environmental and health impacts, especially on children. Some of the leading NGOs in the country, with technical staff and capacity like WWF-Pakistan, SDPI, LEAD-Pakistan, SCOPE and IUCN-Pakistan are also contributing significantly in capacity building of stakeholders, environmental monitoring and data collection. SDPI, WWF-Pakistan and SABAWON International are members of International POPs Elimination Network (IPEN) and Global Alliance for Incineration Alternatives (GAIA). SDPI, the IPEN National Focal point participated in International POPs Elimination Project (IPEP), South Asia activities and in collaboration with Pak-EPA and NWFP EPA, undertook studies on the abandoned DDT Factory, Nowshera, POPs Contamination of Chicken Eggs and POPs levels in ash samples from hospitals and brick-kilns in Pakistan. SDPI also organized awareness raising workshops on “Chemicals Health Impacts” for journalists, representatives of local government, primary teachers, farmers and industrial workers. Recently, SDPI has been made NGOs Focal Point for Strategic International Approach for Chemical management (SAICM) and member of UNEP Cadmium and Mercury working Group. Several civil society organization exist at gross root level. These organizations have direct contact with the public in their own areas. There is urgent need to build capacity of these Community Based Organizations (CBOs), Village organizations (VOs) and other Non-Governmental Organizations (NGOs) spread the information at gross-roots level.

3. STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN (NIP)

3.1. Policy Statement

The Government is determined to eliminate the POPs as soon as practicable by implementing the NIP in line with the requirements of the Stockholm Convention and to undertake review of the relevant policies and legislation for effective implementation of the Stockholm Convention as well as other related conventions and international processes on chemicals management. This shall facilitate strengthening of capacity of institutions that deal with POPs including the establishment of mechanisms for coordination, reporting and monitoring of POPs and the review and updating of the NIP. Government also realizes the importance of generating and dissemination of public information and creation of public awareness at all levels to tackle concerns of POPs in a comprehensive way. In doing so, the Government within its limited capacity, shall make deliberate efforts to implement its obligations under the Stockholm Convention and hence eliminate POPs as scheduled.

The Government would take appropriate measures to ensure implementation of the national priorities on POPs as would be specified in the Action Plans. The main priority issues would be grouped in six major areas namely, elimination of POPs, rational management of obsolete stockpiles/ contaminated sites, strengthening legal and institutional framework for managing POPs and chemical pollutants; establishing monitoring program for POPs and other chemical pollutants; enhancing transfer of appropriate technology for control of POPs releases; and improving public information, awareness and education.

Government targeted milestones for some specific themes are as follows:

- Elimination of pesticide POPs and rational management of obsolete stocks/contaminated sites
- Promotion awareness in relation to all action plans, but particularly for POPs.
- Strengthening of the information base, surveillance and data management for POPs
- Strengthening the legislative infrastructure for control and enforcement of POPs
- Institutional strengthening.
- Human resources development for implementation of the Stockholm convention as envisaged in the National Implementation Plan (NIP).

It is anticipated that successful implementation of the identified priorities would reduce/eliminate some of the POPs chemicals and wastes containing POPs.

3.2 Implementation Strategy for National Action Plan (NIP)

3.2.1 Objectives and Priorities of Action Plan

The goal of the Action Plan is to ensure reduction and ultimate elimination of POPs and their releases so as to protect human health and environment. The Action Plan addresses the identified gaps and deficiencies in order for Pakistan to meet the requirements of the Stockholm Convention in elimination of POP releases. It also defines objectives, time bound activities and required resources (human, material, infrastructural and financial). The implementation of the Action Plan envisages the participation of a broad spectrum of stakeholders.

3.2.2 Overall Objectives

The overall objectives of the Action Plan are:

- I. To build national capacities in POPs management in terms of human resources and infrastructure;
- II. To raise stakeholders awareness on POPs hazards and management;
- III. To minimize risks on environment and human health from POPs
- IV. To promote environmentally sound technology for disposal of POPs wastes;
- V. To promote POPs networking;
- VI. To strengthen legal framework and enforcement mechanisms;
- VII. To promote research and development of alternatives to POPs, and
- VIII. To develop mechanisms for promoting proper management of POPs stockpiles and the contaminated sites.

The overall objectives provide basis for identifying/formulating the specific objectives and actions needed to strengthen management and control of POPs consistent with Article 3 and 6 of the Stockholm Convention as well as articles 5, 6 and 10 of the Rotterdam Convention in the course of implementation of the Action Plan.

3.2.3 Constraints

By comparing the inventory findings with the Convention requirements and the available legislation, the following gaps and deficiencies were identified: -

- XXIII. Inadequate legal provisions on POPs production, screening, importation, use and disposal of their waste. Also on identification, liability and management of contaminated sites;
- XXIV. Weak enforcement mechanisms, for example on disposal of wastes;
- XXV. The Plant Protection Act does not provide for the identification and quantification of pesticides stockpiles;
- XXVI. Lack of legal provision focusing on public awareness on health and environmental risks associated with POPs

- XXVII. There is no legal provision for monitoring of POPs release and their effects to human and environment;
- XXVIII. There are no legal provisions focusing on POPs life cycle.
- XXIX. Inadequate awareness of importers and custom officers on imports requirements;
- XXX. Inadequate information on the past production, use, import and export;
- XXXI. Lack of continuing education to update skills for evaluation of technical data submitted during registration of pesticides;
- XXXII. Lack of specialized skills and analytical equipment for identification of undeclared pesticides ingredients and monitoring of POPs levels;
- XXXIII. Inadequate training POPs inspectorate services;
- XXXIV. Lack of guidelines on risk minimization procedures for handling, transportation, storage and disposal of obsolete stocks;
- XXXV. Inadequate specialized skills, financial resources, equipment and working tools by respective institutions dealing with POPs;
- XXXVI. Poor storage facilities and inappropriate disposal facilities;
- XXXVII. Improper disposal of pesticides empty containers and PCBs equipment;
- XXXVIII. Very few studies and little data on POPs environmental and health impacts;
- XXXIX. Poor information exchange and data keeping;
- XL. Inadequate resources for dissemination of information on the viable POPs alternatives;
- XLI. Lack of resources to ascertain suitability of alternatives and assess their risks to human health and the environment;
- XLII. Inadequate resources to support preparation and execution of training and awareness raising programs;
- XLIII. Lack of socio-economic and cultural studies on the acceptability and affordability of alternatives; and
- XLIV. Incomplete inventories for POPs

3.2.4 Prioritization

The priority issues to be addressed include:

- I. Establishing environmentally sound technologies for disposal of POPs wastes;
- II. Developing mechanisms to promote proper management and control of stocks, stockpiles of POPs, contaminated sites and equipment;
- III. Strengthening legislation enforcement mechanisms;
- IV. Developing monitoring programs on POPs effects and their impacts to human health and the environment;
- V. Review of existing legislation in line with the Stockholm Convention requirements for POPs management;
- VI. Development of guidelines for POPs management;
- VII. Enhancing levels of awareness on risks of POPs;
- VIII. Developing programs to promote the use of alternatives to POPs use, Best Environmental Practices (BEPs), Best Available Technologies (BATs), including non- incineration technologies for POPs environmentally sound disposal
- IX. Strengthening capacity in POPs management in terms of manpower, infrastructure and application of Best Available Technologies (BATs) and for promoting Best Environmental Practices (BEPs).
- X. Strengthening of international co-operation on exchange of technical information to improve scientific knowledge and skills in POPs management.

3.3 Activities, Strategies and Action Plans

3.3.1 POPs Pesticides: Elimination by 2010, and rational management of obsolete stocks/contaminated sites by 2015

While the importation and manufacture of POPs pesticides have been banned since 1996, reliable data regarding the full extent of occurrence of POPs pesticides in Pakistan is not available. However, the EPA Pakistan with collaboration of POPs Enabling Activity Project, UNDP has already completed Inventories of obsolete POPs- Pesticides sites in all provinces and Federal Capital Territory. The inventories of the remaining unidentified obsolete pesticides (if any) will be completed during implementation of NIP. There appears from circumstantial evidence that banned pesticide POPs are still available in the market place and a market survey will be undertaken to estimate the extent and identify the possible origin of these illegal products. The objectives of this action plan are as under:

- By the end of 2010 to prepare a phased plan to safely store and ultimately eliminate an estimated 6030MT of obsolete POPs containing pesticides from 430 identified sites by 2012, proposed to be undertaken through Federal and Provincial programmes.

- Survey completed by 2012 of other obsolete pesticide stocks/contaminated sites (if any) not yet identified as containing POPs, including the necessary sampling and analysis.
- A phased plan developed between 2010 and 2011 to safely store and ultimately eliminate remaining obsolete pesticides and rehabilitate all contaminated sites by 2015, proposed to be undertaken through Federal and Provincial programmes
- A study designed by end of 2010 to identify and quantify sources of illegal POPs pesticides in Pakistan, with a view to proposing by 2012 measures to eliminate them.
- Review completed by the end of 2011 of potential indigenous research for developing and promoting environmentally friendly alternatives to POPs pesticides under local conditions.

Details of activities/tasks and other details for the same are given below:

3.3.1.1. By the end of 2010 to prepare a phased plan to safely store and ultimately eliminate an estimated 6030 MT of obsolete POPs containing pesticides from 425 identified sites by 2012, proposed undertaken through Provincial programs

Activities	Indicators	Responsibility	Resources US \$
1. Acquisition of Expertise for technical advice and support to the implementing agency	Experts on board	MOE/EPA	16,000
2. Carry out research on low cost methods of disposal	Reports prepared	Consultant/ EPA	15,000
3. Update baseline information on POPs pesticides stockpiles and waste in terms of identity, quantity and locations	Web site in place	MOE/EPA MINFAL	10,000
4. Prepare a final detailed work plan for disposal operations	Reports prepared	MOE/EPA MINFAL	1,000
5. Conduct stakeholders forum for informal decision making and resource mobilization	Committed resources	MOE/EPA MINFAL	12,000
		Total	54,000

Time Frame of above activities (12 Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Acquisition of Expertise	EPA/UNDP	█	█	█	█								
2. Carry out research on low cost methods of disposal	MoE/EPA MINFAL				█	█	█	█	█	█			
3. Update baseline information on POP pesticides stockpiles and waste in terms of identity, quantity and locations	MoE/EPA MINFAL			█	█	█	█						
4. Prepare a final detailed work plan for disposal operations	MoE/EPA MINFAL									█	█		
5. Conduct stakeholders forum for resource mobilization	MoE/EPA MINFAL										█	█	

3.3.1.2. Survey Completed by 2012 of other obsolete pesticide stocks/contaminated sites not yet identified as containing POPs, including the necessary sampling and analysis.

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of the consultant for advice and support to the implementing agency, one for each province	Consultant Hired	MoE, UNDP	25,000
2. Working group formed in four provinces	Report completed	Consultant	5,000
3. Visits/ Survey	Survey completed	Consultant	5,000
4. Organizing the meetings	Meetings conducted	MoE, Agric. Ext. Dept.	10,000
5. Sampling and analysis for identification	Collected and analyzed samples	Laboratories	20,000
6. Kind Quantification of POPs pesticides, identification	POP Pesticides Quantified in all provinces		
7. Final reporting	Updated Inventories reports submitted to POPs Project		1,000
		Total	66000/-

Time Frame of above activities (24 Months)

Activities	Actors	2	4	6	8	10	12	14	16	18	20	22	24
1 Acquisition of Expertise	MoE/ EPA UNDP	■	■										
2. Working group formed in four provinces	Consultant		■	■	■								
3. Visits/ Survey	Consultant			■	■	■	■						
4. Organizing the meetings	MoE, Agric. Ext. Dept.			■	■	■	■						
5. Sampling and analysis for identification	UAAR Lab.					■	■	■	■	■	■		
6. Kind Quantification of POPs pesticides identification	UAAR									■	■		
7. Final reporting											■	■	

3.3.1.3. A phased plan to safely store and ultimately eliminate remaining obsolete pesticides developed between 2010 and 2012 and to rehabilitate all contaminated sites by 2015, to be undertaken through Provincial Programmes.

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of consultant for advice and support to the implementing agency	Consultant hired	MoE/UNDP	10,000
2. Working groups formed at all province levels	Working groups formed		-
3. Selection and acquisition of suitable sites for storing obsolete pesticides	Sites selected	Provincial Depts, EPA, Agric Extension Dept	200, 000
4. Construction of stores in all provinces	Store houses in place	Provincial departments	250,000
5. Establish and procure lacking facilities (i.e. i.e. cranes, fork lifters, treatment or disposal facilities) and upgrade storage facilities including existing storage facilities, involving identification of needs and training staff on proper utilization	Enhanced capacity in management of POPs pesticides	MoE/EPA MINFAL	25,000
6. Execute field operations which include collection , transportation of POPs pesticides	Stockpiles of POPs pesticides cleaned	MoE/EPA, Provincial departs; MINFAL	200,000
Total			6, 85, 000

Time Frame of above activities (24 Months)

Activities	Actors	2	4	6	8	10	12	14	16	18	20	22	24
1. Acquisition of Expertise	MoE/UNDP												
2. Working group formed at all province levels													
3. Selection of suitable sites for storing obsolete pesticides	Provincial Depts. EPA. Agric. Extension Dept.												
4. Construction of stores in all provinces	Provincial departments												
5. Establish and procure lacking facilities (i.e. cranes, fork lifters, treatment or disposal facilities) and upgrade storage facilities including existing storage facilities, involving identification of needs and training staff on proper utilization	Provincial Departments/ Pak EPA/ MOE												

3.3.1.4 A study designed by end of 2010 to identify and quantify sources of illegal POPs pesticides in Pakistan, with a view to proposing by 2013 measures to eliminate them.

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of Consultant for advice and support to the implementing agency	Consultant hired	MoE/UNDP/ Pak EPA	16,000
2. Capacity Building of custom's staff and quarantine	Entrance check identified	MoInterior/MOCOM MINFAL	18,000
3. Monitoring the import of pesticides	Monitoring Data/reports	MoE/MoI	10,000
4. Laws/standards developed & implemented	Strict compliance of laws by quarantine department	MoE/MoI	25,000
5. Consumer market surveys, testing and analyses of samples in all the Provinces FATA, FANA and AJK.			100,000
		Total	1,69,000/-

Time Frame of above activities (36 Months)

Activities	Actors	3	6	9	12	15	18	21	24	27	30	33	36
1. Acquisition of Expertise	MoE/UNDP												
2. Capacity Building of custom's staff and quarantine	Ministry of Interior/ Commerce MINFAL												
3. Monitoring the import/illegal traffic of pesticides	MoE/MoI MINFAL M.O.Commerce												
4. Laws/standards developed & implemented	MoE/MoI												
5. Consumer market survey, testing and analyses of samples in all the provinces & AJK	UNDP/ EPA/ EPD												

3.3.1.5. Review completed by the end of 2011 of potential indigenous research for developing and promoting environmentally friendly alternatives to POPs pesticides under local conditions.

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of Consultant to undertake review	Consultant hired	MoE/UNDP	6,000
2. Surveys of existing Integrated Pest Management (IPM) and other alternate/ appropriate technologic in Pakistan	Reports prepared	Consultant	8,000
3. Prepare Recommendations and share with Stakeholders.	-	EPA/ MoE	16, 000
		Total	30,000

Time Frame of above activities (12 Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Acquisition of Expertise	MoE/UNDP												
2. Surveys of existing Integrated pest management (IPM) projects in Pakistan	Consultant												
3. Identification of appropriate Technologies by each province/region	Consultant												
4. Stakeholders dialogue													

3.3.2 Polychlorinated Biphenyls (PCBs): Elimination by 2025

In the light of the assessment of PCBs issues in Pakistan as described in 2.3.2 in the preceding pages, the objectives of action plan for PCBs phase out are:

1. Completion by the end of 2013 of PCB quantification survey of about – 471316 working and 376242 damaged transformers, with planned sampling and analytical program to determine extent of PCB contamination, and identify equipment to be urgently replaced and sites needing rehabilitation.
2. With the WAPDA, IPPs and others electricity generation/transmission and related appropriate authorities, by the end of 2013, development of a phased PCB contaminated transformer elimination program, for implementation within the 2025 target with urgent attention given to eliminating leaking equipment.
3. By 2012 prepare projects detailing program for decontamination and rehabilitation of sites contaminated with PCBs, for implementation by 2025
4. By 2012, prepare a review of cost effective options for destruction of PCBs contaminated oils and environmentally sound management of PCB contaminated equipment, as are expected to be generated through the decommissioning program above, and prepare corresponding projects.
5. By 2025 Decontaminate and rehabilitate all sites and equipment contaminated with PCBs.

The above objectives would be achieved by undertaking the following activities/tasks:

- Identification of PCBs contaminated equipments and sites.
- Establishment of analytical laboratory for PCBs chemical analyses.
- Procurement of technical staff and their training for analysis of PCBs contaminated oil, soil and sludge samples and maintenance of laboratory equipment/facilities
- Establishment of district liaison offices for survey and field work to collect and transport PCBs contaminated environmental samples to the central/provincial laboratories.

- MoUs between the collaborating agencies such as WAPDA, IPPs, EPAs/EPD and other institutions for sharing responsibilities and financial liabilities for survey, fieldwork, and analytical work.
- Development of survey/fieldwork design, sampling protocol and standard operating procedures for spot tests on sites and chemical analyses.

Details of the specific activities, tasks, time frame and budget for meeting the stated objectives are given in the next pages.

3.3.2.1. Completion by the end of 2013 of PCB Quantification survey, with planned sampling and analytical program to determine extent of PCB contamination, and identify equipment to be urgently replaced and sites needing rehabilitation

Activities	Tasks	Proposed Collaborating Agencies	Duration	Estimated Costs (US \$)	Potential Source of Funding
1. Identification of two required analytical facilities on Provincial basis, ensuring their operability and calibration	<ul style="list-style-type: none"> ▪ Identify two suitable laboratories with the required analytical equipment (e.g.) HPLC / GC detectors) ▪ Execute contact with the chosen laboratories ▪ Undertake a laboratory inter-collaboration of the analytical procedures ▪ Develop protocols and Standard Operating Procedures ▪ Develop guidelines and handbooks covering methods, procedures and technical specifications for analytical work 	Ministry of Environment (ME), Ministry of water and power (MWP), WAPDA/PPs, Provinces and AJK, FATA, FANA	6 Months	2,000/- 10,000/- 20,000/-	International Donors / National Organizations
2. Design and test a transformer and soil sampling program for each province: AJK, NAs, Federal Territory establishing agreed procedure with those to	<ul style="list-style-type: none"> ▪ Agreement between Ministry of Environment (MOE) and WAPDA, IPPs and other agencies on the basis for survey including specific sites and areas to be covered with a view to implementing an agreed protocol ▪ Design the modus operandi of the survey/sample testing 	MOE, WAPDA/PPs, AJK/NAs/FATA Provinces.	6 Months	2,000/- 10,000/-	International Donors / National Agencies
3. Raise knowledge and skills on sampling, identification, labeling procedures and reporting	<ul style="list-style-type: none"> ▪ Preparation of training manual ▪ Specification and procurement of sampling /Analytical Equipment ▪ Training seminars / courses for the employees of WAPDA, IPPs, involved laboratory staff and others. 	MOE, WAPDA/PPs, AJK/NAs / FATA/ Governments.	6 Months	20,000/- 300,000/- 200,000/-	International Donors / National Agencies
4. Identification of PCB presence in Existing Transformers	<ul style="list-style-type: none"> ▪ Sampling and assessment of PCB presence through laboratory tests and kits ▪ Labeling of transformers 	MOE, WAPDA/PPs, AJK/NAs/ FATA/Provinces	3 Years	1,50,000/- 50,000/-	International Donors / National Agencies
5. Monitoring of existing quantities of PCBs in transformers and reporting every 5 years on progress in eliminating PCBs	<ul style="list-style-type: none"> ▪ Establishment of the central data bank ▪ Annual report on the state of PCBs ▪ Annual progress report on elimination of PCBs 	MOE, WAPDA/PPs, AJK/NAs Provincial Governments.	3 Years	50,000/- 20,000/- 20,000/-	International Donors / National Agencies
Total = 854,000					

TIME FRAME (MONTHS)

ACTIVITY IN MONTHS	3	6	9	12	15	18	21	24	27	30	33	36
1. Identification of two required analytical facilities on provincial bases, ensuring their operability and calibration												
2. Design transformer and soil sampling program for each province: AJK, NAs, Federal Territory establishing agreed procedure with those to undertake the survey												
3. Raise knowledge and skills on sampling, identification, labeling procedures and reporting												
4. Identification of existing PCBs presence in transformers												
5. Monitoring of existing quantities of PCBs in transformers and reporting every 5 years on progress in eliminating PCBs												

3.3.2.2: With the WAPDA, IPPs and other electricity generation/ transmission and other appropriate authorities, by the end of 2013 Development of a phased PCB contaminated transformer elimination program, for implementation within the 2025 target.

Activities	Tasks	Proposed Collaborating	Duration	Estimated Costs	POTENTIAL SOURCE OF FUNDING
1. Establish a system for collection of PCB contaminated transformers and oil for environmentally sound storage of used PCB oil awaiting subsequent destruction (see 3.3.3.3)	<ul style="list-style-type: none"> ▪ Identify suitable sites for temporary centralized safe storage of PCB contaminated damaged/ leaking transformers and PCB oils. ▪ Implement safe storage of PCB-contaminated and damaged transformers & PCBs oils. 	MOE, WAPDA/IPP, A, JK/NAs/FATA/Provincial Governments	3 Year	50,000/- 3,00,000/-	International Donors / National Organizations
2. Based on survey undertaken under objective 1, Development of phased program for PCB containing transformers elimination	<ul style="list-style-type: none"> ▪ Preparing a plan involving priorities based on contamination levels and technical state of the transformers ▪ Procurement of technology for destruction of PCB containing transformers. 	ME, WAPDA/IP, A, JK/NAs/FATA/Provincial Governments.	1 Year	50,000/-	International Donors/ National Organizations
3. Phased out transformers according to plan developed above.	<ul style="list-style-type: none"> ▪ Timetable and cost to be established on the bases of the survey above. 	MOE, WAPDA/IPP, A, JK/NAs Governments.	6 Years	Costs to be based on market prices at the time of implementation	International Donors

Total = 400, 000

Time Frame (Months)

ACTIVITY IN MONTHS	6	12	18	24	30	36	42	48	54	60	66	72	
1. Establish a system for collection of PCB contaminated transformers and oil for environmentally sound storage of used PCB oil awaiting subsequent destruction (see 3.3.3.3)													
2. Based on survey undertaken under objective 1, Development of phased program for PCB containing transformers elimination													
3. Phased out transformers according to plan developed above.													

3.3.2.3 By 2013 prepare a review of cost effective options for destruction of PCB contaminated oils and environmentally sound management of PCB contaminated equipment, as are expected to be generated through the decommissioning program above, and prepare a corresponding action plan.

Activity	Task	Proposed Collaborating Agencies	Duration	Estimated Costs	POTENTIAL SOURCE OF FUNDING
Develop a recommended program for cost effective destruction of PCB oils and elimination of contaminated equipments.	<ul style="list-style-type: none"> ▪ Review technology and other options with costs for environmentally sound destruction of PCBs & contaminated oils. ▪ Review technology & other options with costs for environmentally sound elimination of PCBs contaminated equipments. ▪ Prepare a report recommending a 	MOE, WAPDA/IPPs, AJK/NAs /FATA, Provincial Governments	3 Year 3 years 6 months	2,0,000/- 2,00,000/- 5,000/-	International Donors/ Power Companies/ National Organizations
				Total: 45, 000	

**3.3.2.4. By 2015 Decontaminate and Rehabilitate sites contaminated with PCBs
By 2015 Decontaminate and Rehabilitate sites contaminated with PCBs**

Objective 4 (Corrected on 12 th Sept 2006)					
By 2013 Decontaminate and Rehabilitate sites contaminated with PCBs					
Activities	Tasks	Implementing Agencies	Duration	Estimated Costs \$ (US)	POTENTIAL SOURCE OF FUNDING
1. Identification of PCB contaminated sites and their treatment and preoperational plan for decontamination	<ul style="list-style-type: none"> ▪ Preparation of plan for collection and decontamination of the surface layer of soil taken from the areas contaminated due to leakages of PCB containing oils from the equipment 	MOE, WAPDA/IPPs, AJK/NAs/ FATA Provincial Governments	1 Years	Cost to be estimated on the basis of the survey	International Donors
2. Decontamination of areas contaminated with PCBs.	<ul style="list-style-type: none"> ▪ Based on the survey under Objective 1. prepare a prioritized site decontamination and rehabilitation plan. ▪ Prepare a review of technology & other option for PCB contaminated site rehabilitate and review actions according to the site conditions 		15 Years	Cost to be estimated on the basis of the survey.	

3.3.3. Reduction in Emissions of Unintended POPs

As also mentioned under 2.3.3.(assessment of U-POPs) in the preceding pages, there is currently no capacity to measure dioxins and furans in Pakistan, therefore, studies of estimated emission of unintended POPs (U-POPs), based on the UNEP Tool Kit, were undertaken in all Provinces and Federal Territories, enabling identification, with relative importance, to be made of the major sources of U-POPs in the country by Province. Projections now need to be made of potential releases of U-POPs expected from each major source as a result of anticipated economic growth with a view to better prioritizing actions to reduce these emissions in accordance with the Stockholm Convention requirements. Meanwhile the cost-effective application of best available techniques (BAT) and best environmental practices (BEP) under conditions in different regions of Pakistan need to be examined with a view to their appropriate and timely application. The objectives of the action plan for reduction in emissions of unintended POPs in the country are:

- Based on current inventories of U-POPs, prepare by the end of 2011 a ten year projection of emissions, completing where necessary the inventorization to include areas of the country (if any) not covered so far and prioritise sectors for implementation of BAT and BET. (a) During 2010, undertake a study to project likely trends in emissions of U-POPs through to 2015, based on current inventories and economic development projections; completing or updating inventories for areas of the country not yet covered in the original inventories. (b)Based on the projections through to 2015, by mid-2011 prioritise sectors for implementing BAT and BET during the period 2012 to 2020, reviewing the cost-effectiveness options under local conditions, recommending costed activities and programmes for implementation, particularly for: (i) ferrous and non-ferrous metals, (ii) power generation and heating, (iii) minerals production, (iv) production of chemicals and consumer products. Transport and waste disposal are subject of separate action plans (see 3.3.3.1.3 and 4.)
- Implement chosen BAT and BEP over the period 2011 to 2015 based on the results of 3.3.3.1.2; costs and modus operandi to be developed in accordance with the chosen options.
- Prepare a review during 2011 of government policies and programmes for energy use in the transportation sector, particularly the use of CNG, as to projected impacts/reductions in U-POPs emissions and recommend appropriate options for optimising the benefits from U-POPs reduction.
- By the end of 2011 examine and prepare a report with costed recommendations for action of local options applicable in Pakistan for environmentally sound management of various types of waste, including current practices of uncontrolled open burning, particularly the cost effectiveness of incineration. (a) Municipal Waste and uncontrolled burning, (b) Medical/Hospital Waste (c) Hazardous Waste
- Implementation in a phased manner over a ten year period of chosen options for environmentally sound management of waste in accordance with the recommendations of the activities 3.3.3.4.1/2/3; costs and modus operandi depending of options chosen.

3.3.3.1 Based on current inventories of U-POPs, prepare by the end of 2007 a ten year projection of emissions, completing where necessary the inventories to include areas of the country not covered (if any) in the originally inventories, and prioritise sectors for implementation of BAT and BEP.

3.3.3.1.1 During 2010, undertake a study to project likely trends in emissions of U-POPs through to 2015, based on current inventories and economic development projections; completing or updating inventories for areas of the country not yet covered in the original inventories.

Reliable data regarding extent of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo-furans PCDD/PCDF is not available because adequate laboratory facilities are not available in the country. Few studies on U-POPs in the country have been carried out but the laboratory tests were conducted in laboratories outside the country. The EPA, Pakistan with the collaboration of POP Enabling Activity Project, UNDP has already completed Dioxins and Furans inventories in all Provinces and Federal Capital Territory adopting the “Standardized toolkit for identification and Quantification of Dioxin and Furans release”.

For the completion of the current inventories and future projections, the details of activities, indicators, responsibilities/actors, resources required, costs, contribution from local institutions, etc and the time frame for each activity are given below in Table Nos. 3.3.3.1 and 3.3.3.2.

Table 3.3.3.1 Activities, Indicators, Responsibilities, and Resources for Updating and Projecting Dioxin and Furan Inventories

Activities	Indicators	Responsibilities	Resources (US\$)
1. Hiring of human resources: Inter./National - TOR - Qualification/exp.	Experts Hired	Consultant MoE/EPA, MoI, NGO, Int. Dev. Agencies*	6,000
2. Groups formulation: - Federal - Provincial - Regional	G. Formed	MoE/ EPA, MoI,	10,000
3. Review and updation of the inventories: - Federal - Provincial - Regional - National	Draft report	MoE/EPA, MoI, NGOs, INGOs	25,000
4. Organizing Meetings: - Federal - Provincial - Regional - National	No. of meetings	MoE/EPA, MoI, NGOs	1,000
5. Finalizing of the updated inventories and projections:	Final report	MoE/EPA, MoI, NGOs, INGOs	2,000

Activities	Indicators	Responsibilities	Resources (US\$)
- Federal - Provincial - Regional - National - Printing			
Total			44,000

Table 3.3.3.2 Time Frame

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Hiring of human resources	MoE/ EPA/ UNDP	■	■										
2. Groups formulation	MoE/EPA, MoI, BGO, IGO			■	■								
3. Drafting of the Projecting of inventories	MoE/EPA, MoI, BGO, IGO			■	■								
4. Organizing Meetings	MoE/EPA, MoI, BGO, IGO					■	■						
5. Finalizing of the projections Inventories	MoE/EPA, MoI, BGO, IGO						■	■					

3.3.3.1.2 Based on the projections through to 2015, by mid-2011 prioritise sectors for implementing BAT and BET during the period 2012 to 2015, reviewing the cost-effective options under local conditions, recommending costed activities and programmes for implementation, particularly for: (i) ferrous and non-ferrous metals, (ii) power generation and heating, (iii) minerals production, (iv) production of chemicals and consumer products. Transport and waste disposal are subject of separate action plans, see 3.3.3.1.3 and 4.

In Pakistan there is an increasing trend of production and mining of resources which is producing and contributing significantly to the emissions of U-POPs into the environment. Among others, Ferrous & Non-Ferrous metal productions alone are producing estimated 2123.527 g TEQ/year Dioxins and Furans in the country. In many industrial units, the production processes/techniques are old without adoption of any BATs or BEPs. Besides Ferrous & Non-Ferrous metal productions others priority sectors for the implementation of BATs and PEPs in country provinces are given below:

- Power generation and heating/cooking processes (all provinces)
- Mineral based products (Punjab & Sindh)
- Un-controlled combustion processes (all provinces)

- Production of chemical & consumer goods (all provinces)

Implementation of BATs & BEPs is planned for all the above sectors as well as Ferrous & Non-Ferrous metal productions. Details of action plan with time frame for the activities for given in **Table No. 3.3.3.1.2.1 and 3.3.3.1.2.2**

Table No. 3.3.3.1.2.1 Activities, Indicators, Responsibilities, and Resources for implementation, particularly for: (i) ferrous and non-ferrous metals, (ii) power generation and heating, (iii) minerals production, (iv) production of chemicals and consumer products.

Activities	Indicators	Responsibilities	Resources (US\$)
1. Hiring of human resources: Inter./National - TOR - Qualification/exp.	Experts Hired	MoE/EPA, MoI, NGO, Int. Dev. Agencies, MoLaw	Inter 56,000 Local 16,000
2. Groups formulation: - Federal - Provincial - Regional	Groups Formed	MoE/EPA, MoI, NGOs, MoLaw	1,000
3. Reviewing: - Inter - Local	No. of references cited	MoE/EPA, MoI, NGOs, MoLaw	
4. Organizing Meetings: - Federal - Provincial - Regional	No. of meetings	MoE/EPA, MoI, NGOs, MoLaw	20,000
5. Legal needs: - New laws - Revised	No. of law ident & formulated	MoE/EPA, MoI, MoLaw, NGOs. INGOs	20,000
6. Prioritization and report preparation	Prioritized and report prepared	MoE/EPA, MoI, NGO, IGNO, MoLaw	2,000
Total			114,000

Table No. 3.3.3.1.2.2 Time frame. (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Human resources hiring	MoE/EPA, MoI, NGO, Int. Dev. Agencies, MoLaw												
2. Groups formulation	MoE/EPA, MoI, NGOs,												

	MoLaw													
3. Reviewing	MoE/EPA, MoI, NGOs, MoLaw													
4. Organizing Meetings	MoE/EPA, MoI, NGOs, MoLaw													
5. Awareness	MoE/EPA, MoI, MoInfor., INGO, NGO													
6. Legal needs	MoE/EPA, MoI, MoLaw, NGOs. INGOs													
7. Prioritization & reporting	MoE/EPA, MoI, NGO, IGNO, MoLaw													

3.3.3.2 Implement chosen BAT and BEP over the period 2012 to 2020 based on the results of 3.3.3.1.2; costs and modus operandi to be developed in accordance with the chosen options

The priority options for implementation of BAT and BEP under local socio-economic conditions with reference to possible differences in the Provincial situations have been described in 3.3.3.1.2 above. The plan given below in Table Nos.3.3.3.2.1 and 3.3.3.2.2 describes a program for phased implementation of BAT and BEP for the priorities sectors/areas.

Table No. 3.3.3.2.1 Describe activities, indicators, responsibilities, and resources for a program for phased implementation of BAT and BEP for the priorities sectors/areas.

Activities	Indicators	Responsibilities	Resources US\$
1. Hiring of human resources	Hired	MoE/EPA,	30,000
2. Study Groups formulation for analysis and strategy formulation: - Federal - Provincial - Regional	G. Formed	MoE/EPA, MoI,	30,000
3. Reviewing: - Inter - Local	No.of references cited	MoE/EPA, MoI,	
4. Prog. for ferrous & non-ferr. metal prod.	No.of programs	MoE/EPA, MoI, NGOs, INGO	20, 000
5. Program for power gener. & heating.	No.of programs	MoE/EPA, MoI, NGO, INGO	20, 000
6. Program for prod. of mineral products	No.of programs	MoE/EPA, MoI, NGO, INGO	20, 000
07. Program for uncontrolled combustion process	No.of programs	MoE/EPA, MoI, NGO, INGO	20, 000

Activities	Indicators	Responsibilities	Resources US\$
08. Program for prod. of chemicals. & consumer goods	No.of programs	MoE/EPA, MoI, NGO, INGO	20, 000
09. Demo. of BAT and BEP techniques	No. of demo	MoE/EPA, MoI, NGO, INGO	200, 000
10.Report prepaiaon and legal needs	No. of law ident. & formulated	MoE/EPA, MoI, NGO, INGO	25,000
Total:			3,85,000

Table No. 3.3.3.2.2. Time frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Human resources hiring	MoE/EPA, MoI, NGO, MOH	■	■										
2. Groups formulation	MoE/EPA, MoI, NGO		■	■	■								
3. Reviewing / identification	MoE/ EPA, MoI, NGO		■	■	■								
4. Organizing Consultative Meetings	MoE/EPA, MoI, MOH, NGO					■	■	■	■	■	■	■	■
5. Awareness	MoE/EPA, MoI, MOH, NGO					■	■	■	■	■	■	■	■
6. Legal needs	MoE/EPA, MoI, MOH, NGO, INGO					■	■	■	■	■	■	■	■
7. Prioritization	MoE/EPA, MoI,MOH,NGO									■	■	■	■
8. Prog. for ferrous & non-ferr. metal prod.	MoE/EPA, MoI, MOH, NGO								■	■	■	■	■
09. Program for power gener. & heating.	MoE, EPA, MoI,MOH, NGO, INGO								■	■	■	■	■
10. Program for prod. of mineral products	MoE/EPA, MoI, MOH,NGO, INGO								■	■	■	■	■
11, Program for uncontrolled combustion process	MoE/EPA, MoI, MOH, NGO, INGO								■	■	■	■	■
12. Program for prod. of chemicals. & consumer goods	MoE/EPA, MoI, MOH, NGO								■	■	■	■	■
13. Demo. of BAT and BEP techniques	MoE/EPA, MoI, MOH, NGO, INGO								■	■	■	■	■
14. Legal needs	MoE/EPA, MoI, MOH, NGO, INGO								■	■	■	■	■
15. Report preparation									■	■	■	■	■

3.3.3.3. Prepare a review during 2011 of government policies and programmes for energy use in the transportation sector, particularly the use of CNG, as to projected impacts/reductions in U-POPs emissions and recommend appropriate options for optimising the benefits from U-POPs reduction.

The key factors contributing to air pollution in Pakistan are rapidly growing energy demand; and fast growing transport sector. In the cities, widespread use of low-quality fuel, combined with a dramatic expansion in the number of vehicles on roads, has led to significant air pollution problems. Rickshaws have grown by more than 59%, while Motorcycles and scooters have almost doubled over the past ten years. Motorcycles and rickshaws, due to their two-stroke engines, are the most inefficient in burning fuel and contribute most to emissions.

Pakistan is the largest user of CNG in Asia and presently, some 700 CNG stations are operating in the country while 200 are under construction. By March 2005, about 700,000 vehicles were converted to CNG as compared to 450,000 vehicles during same period last year, showing an increase of 56 percent. According to Medium Term Development Framework (MTDF, 2005) government has planned that the use of CNG would be expanded as about 100,000 cars and 10,000 buses would be added every year to the existing stock of country. Government has already planned to undertake the import of natural gas from the neighboring countries to supplement the local supplies and replacement of imported oil with imported gas.

Details of action plan for possible management alternatives for reduction of unintended production of POPs such as conversion to CNG for the transportation sector, and a corresponding program for phased implementation, are described in Table No. 3.3.3.3.1 and 3.3.3.3.2

Table No. 3.3.3.3.1 Activities, indicators, responsibilities and resources for government policies and programmes for energy use in the transportation sector, particularly the use of CNG.

Activities	Indicators	Responsibilities	Resources (US \$)
1. Hiring of human resource	Hired	MoE/EPA, MoI, NGOs, Int. Dev. Agencies	6000
2. Study Groups for analysis: - Federal - Provincial - Regional	G. Formed	MoE/EPA, MoI,	20,000
3. Reviewing: - Inter - Local	No. of references cited	MoE/EPA, MoI,	
4. Org. Meetings: - Federal - Provincial - Regional	No. of meetings	MoE/EPA, MoI,	18,000

5. Prioritization and report preparation	Prioritized and report prepared	MoE/EPA, NGO, MoLaw	MoI, IGNO,	2,000
Total:				46,000

Table No. 3.3.3.3.2. Time Frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Hiring of human resource	MoE/EPA, MoI, NGO, Int. Dev. Agencies												
2. Study Groups for analysis	MoE/EPA, MoI,												
3. Reviewing	MoE/EPA, MoI,												
4. Org. Meetings:	MoE/EPA, MoI,												
5. Prioritization and report preparation	MoE/EPA, MoI, NGO, IGNO, MoLaw												

3.3.3.4. By end of 2011 examine and prepare a report with costed recommendations for action of local options applicable in Pakistan for environmentally sound management of various types (municipal, medical/hospital, hazardous) of wastes, including current practices of uncontrolled open burning, particularly the cost effectiveness of incineration.

Incineration is widely used to reduce the (a) volume of municipal solid waste, (b) the potential infectious properties and volume of medical waste, and (c) the potential toxicity and volume of hazardous chemical and biological waste.

Whether incineration is an appropriate means of managing waste has been the subject of much debate at many national and international forums on environmental issues. A major aspect of the debate is the potential risk to human health that might result from the emission of pollutants, including U-POPs generated by the incineration process, especially if incineration is carried out at lower temperatures. The possible social, economic, and psychological effects associated with living or working near an incineration facility also have been subject of grave concerns.

In Pakistan there are a few incinerators used mainly for burning hospital wastes.

There is no stricter air quality requirements/rule and emissions standards are yet to be developed by Pak-EPA Such rules should specifically be developed to respond to growing concern over possible health risks associated with emissions from the incineration of chlorinated plastics, found predominantly in solid and medical wastes, classified as infectious waste.

In Pakistan the incinerators manufactured locally have no attached air pollution control devices, while the imported ones are too expensive to import and to maintain. There is a need for examination and preparation of a report of local options in Pakistan for environmentally sound management of various types of wastes, particularly the cost effectiveness of incineration. Details of action plan for the same are given in Table Nos. 3.3.3.4.1 and 3.3.3.4.2.

Table No. 3.3.3.4.1 Activities, indicators, responsibilities, and resources for the examination and preparation a report with costed recommendations for action of local options applicable in Pakistan for environmentally sound management of various types of waste.

Activities	Indicators	Responsibilities	Resources (US \$)
1. Hiring of human resources: Inter./National - TO - Qualification/exp.	Hired	MoE/EPA, MoI, NGO, Int. Dev. Agencies	Int.: 48,000 Nat.: 24,000
2. Reviewing: - International - Local - Neighboring countries	No.of references cited	MoE/EPA, MoI,	20,000
3. Drafting and preparation of the report	Draft report	MoE/EPA	5,000
4. Groups formulation: - Federal - Provincial - Regional	G. Formed	MoE/EPA, MoI,	
5. Organizing Consultative Meetings: - Federal - Provincial - Regional	No.of meetings	MoE/EPA, MoI,	55,000
6. Finalizing of the report	Final report	MoE/EPA, MoI, NGO, INGO	2,000
Total			154,000

Table No. 3.3.3.4.2. Time Frame (Months)

Activities	Actors													
		1	2	3	4	5	6	7	8	9	10	11	12	
1. Hiring and working of local and international human resources	MoE/EPA													
2. Reviewing	MoE/EPA													
3. Drafting of the report	MoE/EPA													
4. Groups formulation	MoE/EPA, MoI, BGO, IGO													
5. Organizing Consultative Meetings	MoE/EPA, MoI, BGO, IGO													

6. Finalizing of the report	MoE/EPA, MoI, BGO, IGO										
-----------------------------	---------------------------	--	--	--	--	--	--	--	--	--	--

3.3.3.5. Implementation in a phased manner over a ten year period of chosen options for environmentally sound management of waste in accordance with the recommendations of the activities 3.3.3.4.1/2/3; costs and modus operandi depending on options chosen.

Proper disposal of hospital wastes is crucial for the control of U-POPs in the country. There is an estimated 3050.638 gms TEQ/year through waste incineration (POPs Project studies, 2005). The public health sector is a priority area of Government activities. Under the commitment to achieve the goals of “Health for all,” the agenda of Millennium Development Goals (MDGs) for health and human development is being implemented and a broad based strategy under the poverty reduction strategy (PRS), to attend the imbalances in health sector has been prepared. The existing network of medical services consists of 916 hospitals, 4582 dispensaries 5301 basic health unit (BHUs), 552 rural health centres (RHCs) 906 Maternity and child health centres (MCHs) and 289 T.B Centres (TBCs).

Very few hospitals in the country have proper facilities for incinerations and system for the disposal of hospital wastes. Details of an action plan for environmentally sound management of hospital wastes and time frame for the same are given in Table Nos.3.3.3.5.1 and 3.3.3.5.2.

Table No. 3.3.3.5.1 Activities, indicators, responsibilities and resources of an action plan for environmentally sound management of wastes

Activities	Indicators	Responsibilities	Resources (US \$)
1. Identify hospitals, resource persons, venues	Identified	MoE/EPA, MoI, NGO, INGO, MoH	50,000
2. Identify, prioritize, and address specific constraints	Identified	MoE/EPA, MoI, NGO, INGO, MoH	20,000
3. Recycling of the waste demo	Tons/ year	MoE/EPA, MoI, NGOs, Int. Dev. Agencies	100,000
4. Proper dumping of waste demo	Tons/year	MoE/EPA, MoI, Mo. Health	500,000
5. Management system established	Management system developed	MoE/EPA, MoH, NGO, INGO, MoI	500,000
6. Improve collection and disposal system	Identified	MoE/EPA, MoI, NGO, INGO, MoH	500,000
7. Identify foreign and local standard incinerators supplies	Identified	MoE/EPA, MoI, NGO, INGO, MoH	5,000
8. Incinerators combustion chambers installed in hospitals	No. of incinerators installed	MoE/EPA, MoI, NGO, INGO, MoH	500,000
Total			21, 75, 000

Table No. 3.3.3.5.2 Time Frame (years)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Recycling of the waste	MoE/EPA												
2. Proper dumping of waste	MoE/EPA												
3. Management system established; - Organization - Collection - Disposal	MoE/ EPA, MoI, NGO, IGO, MoH												
4. Identify hospitals, resource persons, venues	MoE/EPA, MoI, BGO, IGO, MoH												
5. Improve collection and disposal system	MoE/EPA, MoI, NGO, IGO, MoH												
6. Identify, prioritize, and address specific constraints	MoE/EPA, MoI, NGO, IGO, MoH												

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
7. Identify foreign and local incinerators supplies with standard	MoE/EPA, MoI, NGO, IGO, MoH												

3.3.3.6. Develop by 2012 a program for phased implementation by 2020 of BAT and BEP for other areas, not initially chosen as priorities above.

In the 3.3.3.1 a number sources for Dioxins and Furans were identified for the reduction of unintended POPs. In the present section the phased implementation by 2014 of BAT and BEP for other areas, not initially chosen as priorities are discussed. These include disposal/land filling, and identification of hotspots.

Detail of an action plan to be developed by 2012 a program for phased implementation by 2014 of BAT and BEP for other areas, not initially chosen as priorities and time frame for the same are showed in **Table Nos.** 3.3.3.6.1 and 3.3.3.6.2

Table No. 3.3.3.6.1 Activities, indicators, responsibilities, and expenditures for a programme develop by 2012 for phased implementation by 2020 of BAT and BEP for other areas, not initially chosen as priorities above

Activities	Indicators	Responsibilities	Resources (US \$)
1. Hiring of human resources: Inter./National - TO - Qualification/exp.	Hired	MoE/EPA, MoI, NGO, Int. Dev. Agencies	Int.: 48,000 Nat.: 24,000
2. Reviewing: - International - Local - Neighboring countries	No.of references cited	MoE/EPA, MoI,	20,000
3. Drafting of the report	Draft report	MoE/EPA	5,000
4. Groups formulation: - Federal - Provincial - Regional	G. Formed	MoE/EPA, MoI,	
5. Organizing Consultative Meetings: - Federal - Provincial - Regional	No.of meetings	MoE/EPA, MoI,	30,000

6. Finalizing of the report	Final report	MoE/EPA, MoI, NGO, INGO	2,000
Total			129,000

Table No.3.3.3.6.2 Time Frame (Months)

Activities	Actors	Time Frame (Months)											
		4	8	12	16	20	24	28	32	36	40	44	48
1. Hiring of Consultant	MoE/EPA, MoI, NGOs, MOH												
2. Groups formulation	MoE/EPA, MoI, NGO												
3. Reviewing	MoE/EPA, MoI, MOH, NGOs												
4. Organizing consultative Meetings	MoE/EPA, MoI, BGO, IGO												
5. Awareness	MoE/EPA, MoI, MOH, NGO												
6. Legal needs	MoE/EPA, MoI, MOH, NGO												
7. Program for miscellaneous categories	MoE/EPA, MoI, BGO, IGO												
8. Program for disposal/land filling categories	MoE/EPA, MoI, BGO, IGO												
9. Program for prod. of mineral products	MoE/EPA, MoI, BGO, IGO												
10. Program for identification of special hotspots categories	MoE/EPA, MoI, BGO, IGO												
11. Demo. of BAT and BEP techniques	MoE/EPA, MoI, BGO, IGO												
12. Awareness	MoE/EPA, MoI, BGO, IGO												
13. Legal needs	MoE/EPA, MoI, BGO, IGO												

3.3.4. Strengthening the Legislative Infrastructure for control of POPs and Enforcement, particularly in relation to action plans 3.3.1, 3.3.2 and 3.3.3

There is no specific legislation in Pakistan dealing with POPs in general and PCBs, DIOXINS & FURANS in particular.. The most effective legal instrument available in the field of chemical management is the Agricultural Pesticides Ordinance of 1971. Its subsidiary legal framework is found in the Pakistan Agricultural Pesticides Rules, 1973. Under these legal instruments, the Directorate of Plant Protection in the Ministry of Food & Agriculture controls the use of pesticides through its registration process. To date there is no inspection mechanism

for chemicals and waste legislation in Pakistan. The Ministry of Environment may be assigned the these functions of management of chemicals from the point of view of the end-results.

The objectives of the action plan 3.3.4 are as follows:

- Based on the review of legislation and its implementation in the situation analysis, develop, through a consultative stakeholder process, by the end of 2010, proposed appropriate regulations to fill gaps for Parliamentary or Administrative action by 2012, and propose mechanism to strengthen enforcement.
- Establish by the end of 2010 an inspection and enforcement unit for environmental legislation, including those related to POPs , at Pak-EPA, ensuring appropriate coordination mechanism with inspection and enforcement units of other Ministries, particularly Agriculture, industry, Health, local government and Labour, and during the period 2010 to 2012 establish corresponding capacity at Provincial EPAs

3.3.4.1 Prepare draft legislation/regulations and amendments to current legal measure, as appropriate, concerning: (a) importation and manufacture of specific POPs; (b) surveillance and monitoring, with registration, of sites where POPs may be found or released; (c) liability of owners of sites where POPs are found and for sound management of waste involving POPs.

The above objective would be achieved by activities such as (a) undertaking stakeholder consultations concerning proposed legal measures with a view to effective implementation and enforcement; and also consult on possible non-legal measures and various incentives to achieve POPs control in Pakistan (b) preparing the necessary administrative actions and ensure that measure are adopted by the appropriate authorities and measure are taken for timely implementation.(c)dissemination through the appropriate channels.

3.3.4.2 Prepare the administrative measure required to establish inspection units, in consultation with Provincial and local authorities and with Department of Finance and Budget.

The above objective would be achieved by (a) identifying responsibilities in Ministries of Environment at Federal and Provincial levels for staffing and operation of the units and (b) consulting with other Ministries and major stakeholders on the modus operandi of the inspection unites.

The activities/ tasks and other details for achieving objective 3.3.4 are given in tables 3.3.4.1 and 3.3.4.1:

Table 3.3.4.1. Activities, indicators, responsibilities & resources

Activities	Indicators	Responsibilities	Resources US\$.
1. Hiring of experts for advice & support to the executing agency	experts hired	MoE/UNDP/EPA	60,000
2. Review existing legislation to incorporate provisions on importation, surveillance and management of POP Pesticides, registration of contaminated sites, responsibility and liability of owners of such sites and of wastes, monitoring of POP Pesticides and alternatives and environmental transport, fate and transformation	Reviewed version of the laws	MoE,EPA MoI,MOL	30,000
3. Disseminate the popular versions of the law		MoE/EPA	5,000
		Total	95,000/-

Table 3.3.4.2 Time Frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Acquisition of the expertise	MoE/UNDP												
2. Review existing legislation to incorporate provisions on importation, surveillance and management of POP Pesticides, registration of contaminated sites, responsibility and liability of owners of such sites and of wastes, monitoring of POP Pesticides and alternatives and environmental transport, fate and transformation	MoE Mo Law												
3. Disseminate the popular versions of the law	MoE/EPA												

3.3.5. Promotion of Awareness in relation to all action plans, but particularly for action plan 3.3.1, 3.3.2 and 3.3.3:

The Stockholm Convention calls for direct or indirect cooperation with national stakeholders, where appropriate, by article 7, paragraph 2. The EPA/MOE would be responsible for planning how public and stakeholder awareness should be raised, how stakeholders will be consulted, how information should be communicated and how questions and concerns should be managed. The UNITAR/UNEP document “Strengthening Information Exchange for Sound Chemicals Management” (February 2003) provides valuable guidance in this regard. Consideration should be given to involving all stakeholders, including nongovernmental organizations and independent experts having experience on outreach campaigns on chemical risk prevention, and to ensuring free access to information to all interested parties, taking language-specific considerations into account. Where appropriate a dedicated information system could be established.

The objectives of action plan 3.3.5 are as follows:

- Development of a series of awareness programmes by 2011 for POPs, targeted for: the public, decision makers and specific target groups and implemented on a continuous basis thereafter.
- A series of attitude changing campaigns planned by 2011 appropriate for specific plans of action to be implemented in accordance with the related action plan.

A consultative group (including key Ministries e.g. Agriculture, Environment, Health and Labour; Industrial Associations and Chambers of Commerce and Industry; Civil Society Groups; Media) would be established to consolidate existing material and to advise for the development of awareness raising activities concerning each type of POPs

3.3.5.1 Development of a series of awareness programs by 2007 for POPs targeted for the public decision makers and specific target groups and implemented on a continuous basis.

Table 3.3.5.1.1. Activities, indicators, responsibilities & resources

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of the consultant for advice and support to the implementing agency	Consultant hired	MoE	6,000
2. Revise and develop public awareness programmes in collaboration with stakeholders	Number of supported awareness activities	MoE/EPA,MOI,MOH MINFAL	2,000
3. Develop and implement strategic interventions to address capacity needs of NGOs, youth and women groups and private sector and facilitate awareness raising activities	Implementation Reports Number of supported Awareness activities Network of awareness raising organization	. MoE/EPA . MINFAL	100,000
4. Support media programs preparation (such as 4 radio Programs and 4 TV Programs) annually	POPs media Programs developed and updated	. MoE/EPA . MINFAL	4,000
5. Implimentation of proto type program	Implemented	MOE, EPA	200,000
6. Establish/ designate information centers and publicize them (i.e. regional libraries)	Centers for POPs Information in place	MoE/EPA MINFAL	100,000
6. Arrange for press conference (at least once per year during commemoration of environment day.)	Agreed schedule	MoE/EPA MINFAL	5000
		Total	4,21,000/-

Table No. 3.3.5.1.2. Time Frame (Months)

Action	<i>Actors</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Execution of the expertise	<i>MoE</i>												
2. Revise and develop public awareness programmes in collaboration with stakeholders	MoE/EPA MINFAL												
3. Develop and implement strategic interventions to address capacity needs of NGOs, youth and women groups and private sector and facilitate awareness raising activities	MoE/EPA MINFAL												
4. Support media programs preparation (such as 4 radio Programs and 4 TV Programs) annually	. MoE/EPA . MINFAL												
5. Establish/designate information centers and publicize them (i.e. regional libraries)	MoE/EPA MINFAL												
6. Arrange for press conference once per year during commemoration of environment day.	MoE/EPA MINFAL												

3.3.5.2. A series of attitude changing campaigns planned by 2011 appropriate for specific plans of action to be implemented in accordance with the related action plan

Table No. 3.3.5.2.1 Activities, indicators, responsibilities & resources

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of the consultant for advice and support to the executing agency	Consultant hired	MoE/UNDP	6,000

2. Conduct 5 training sessions annually for 40 primary and secondary schools teachers and relevant education stakeholders on POPs issues	Training reports No. of trainees	MoE/EPA	25,000
3. Development of educational materials on POPs and review of primary and secondary school curricular.	Educational materials developed	MoE/EPA	25,000
4. Develop training modules for academic and professional development programs	Training modules in place	MoE/EPA	35,000
		Total	91, 000/-

Table No. 3.3.5.2.2. Time Frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Procurement and work of the expertise	MoE/ UNDP												
2. Conduct 5 training sessions annually for 40 primary and secondary schools teachers and relevant education stakeholders on POPs issues	MoE/EPA												
3. Development of educational materials on POPs and review of primary and secondary school curricular.	MoE/EPA												
4. Develop training modules for academic and professional development programs	MoE/EPA												

3.3.6. Strengthening of the Information Base, Surveillance and Data Management in relation to POPs:

At the apex of the Information System/Computer capabilities, there exists Pakistan Computer Bureau with high class manpower and computer equipment. It aims at providing guidance to the government institutions in the data automation process, assist them procure the right equipment, train their personnel and provide continuous help to the computer systems operating in the government institutions. It also obtains contracts from government institutions for undertaking specific computing jobs such as compiling results for educational institutions, computerization of the salary system, etc.

In the data collection and dissemination, Bureau of Statistics in the Ministry of Statistics is the largest single system in operation. It collects, processes, stores and disseminates all the statistics available in the country. It includes agricultural and industrial production, imports and exports, national income estimates, Census of Manufacturing Industries, Census of Mining industries, various periodical and non-periodical survey reports. In all, the Bureau of Statistics has 40 selected publications issued as a result of automation.

Second biggest computerization of data takes place in the CBR where its customs wing compiles foreign trade statistic on periodic basis which is ultimately collected, processed and stored/published for the Bureau of Statistics. All other government institutions are also in the process of computerization of their operations. Pakistan Computer Bureau performing its role as the advisor to the government on computerization obviously ensures compatibility of the computer systems in different institutions. The computer systems also have the capability to access email and the internet.

However, none of the above institutions has been compiling data on POPs.

Reliable and comprehensive data is essential to ensure evidence based decision making for management of POPs and related issues. There is no systematic collection of observed data either on effect of chemicals on health and the environment or on occurrence of POPs in Pakistan. There is a dire need to strengthen these as well as Pak-EPA data/Information base, surveillance and data management in relation to POPs. This action plan aims to provide improved data collection and tool for information management related to POPs.

The objectives of 3.3.6 action plan are:

- Develop by 2011 program for health and environment surveillance of exposure to POPs, for implementation by health and environmental authorities from 2012
- Establish by end of 2011 a web based information management tool to promote improved access to data on POPs in operation.
- A program developed by 2011 for evidence based monitoring on a continuous basis of progress in implementation of the NIP action plans, with an appropriate reporting nationally and internationally for performance evaluation.

3.3.6.1. Develop by 2011 programmes for health and environment surveillance of exposure to POPs, for implementation by health and environmental authorities from mid 2012

The activities/tasks and other details are given in table nos. 3.3.6.1.1 and 3.3.6.1.2.

Table No. 3.3.6.1.1. Activities, indicators, responsibilities & resources

Activities	Indicators	Responsibility	Resources US \$
1.Hiring of the consultant for advice and support to the implementing agency	Consultant hired	MoE/ UNDP	6,000
2. Develop research program on POPs pesticides and their alternatives and effects involving two expert meetings and consultancy	Needs assessment report and research program on POPs alternatives and their effects in place	MoE/EPA MINFAL	5,000
3. Implement research program	Research program implemented and progress reports	MoE/EPA MINFAL	70,000
4. Maintain database of research findings at relevant institutions	Data base in place	MoE/EPA MINFAL	5,000
5. Disseminate research findings involving publication and distribution	Reduction/ elimination of POPs	MoE/EPA MINFAL	10,000
		Total	96,000/-

Table No. 3.3.6.1.2. Time Frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12

1. Acquisition and working of Expertise	MoE/UNDP																		
2. Develop research programme on POPs pesticides and their alternatives and effects involving two expert meetings and consultancy	MoE/EPA MINFAL																		
3. Implement research programme	MoE/EPA MINFAL																		
4. Maintain database of research findings at relevant institutions	MoE/EPA MINFAL																		
5. Disseminate research findings involving publication and distribution	MoE/EPA MINFAL																		

3.3.6.2. Establish by 2011 a web based information management tool to promote improved access to data on POPs.

Table No.3.3.6.2.1 Activities, indicators, responsibilities & resources

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of Consultant for advice and support to the executing agency	Consultant hired	MoE/UNDP	6,000
2. Update focal point website to incorporate POPs information	Update website	MoE/EPA MINFAL	5,000
		Total	11,000/-

Table No. 3.3.6.2.2. Time Frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
Acquisition of Expertise	MoE/UNDP												

Update focal point website to incorporate POPs information	MoE/EPA MINFAL																			
--	-------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

3.3.6.3. A program developed by 2011 for evidence based monitoring on a continuous basis of progress in implementation of action plans.

Table No. 3.3.6.3.1 Activities, indicators, responsibilities & resources

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of Consultant for advice and support to the executing agency	Consultant hired	MoE/UNDP	6,000
2. Review relevant legislation to incorporate reporting obligations	Legal provisions on reporting in place	MoE/EPA MINFAL	2,000
3. Establish reporting requirements by support agencies occupational health centers regarding the number and type of enquiries received	Reporting format and actual reports	MoE/EPA MINFAL	4,000
4. Establish collaboration mechanisms	Collaboration mechanisms identified and established	MoE/EPA MINFAL	5,000
5. Conduct appropriate training of trainers	No. of trainees	MoE/EPA MINFAL	35,000
		Total	52,000/-

Table No. 3.3.6.3.2. Time Frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
Acquisition of Expertise	MoE/UNDP												
Review relevant legislation to incorporate reporting obligations	MoE/EPA MINFAL												
Establish reporting requirements by support agencies occupational health centers regarding the number and type of enquiries received	MoE/EPA MINFAL												
Establish collaboration mechanisms	MoE/EPA MINFAL												
Conduct appropriate training of trainers	MoE/EPA												

	MINFAL																		
--	--------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

3.3.7. Institutional Strengthening.

Action to manage persistent organic pollutants, POPs issues requires infrastructure both administrative and technical. Many institutions in the country that are or need to be involved in the implementation of NIP are weak or inadequate and need to be strengthened. The objectives for action plan 3.3.7 are as follows

- Establish by the beginning of 2011, a legally constituted coordinating mechanism for regular consultation among all stakeholders on implementation of the Stockholm convention
- Develop by end of 2012 a program to strengthen the analytical capacity at selected existing laboratories for the proposed surveys, surveillance and monitoring programs for POPs, as related to NIP.
- Establish by mid 2010 a budgeted Chemical and Waste Management Centre/ Project Management unit, with appropriate staff and facilities/section, for promoting and monitoring the implementation of NIP, as well as other chemical and waste related international agreements, and for the regular updating of the National Chemical Management Profile in accordance with SAICM.
- Prepare by the end of 2010 plan, involving all appropriate stakeholders, for implementing the Globally Harmonized System for Classification and Labeling of Chemicals (GHS), for implementation by 2012.
- Prepare by 2011 a capacity building project detailing needs of federal and provincial Environmental Protection Agencies, capacity development programmes to be implemented between 2011 and 2015 with emphasis on strengthening laboratories facilities.

The activities prepare by 2011 a capacity building project detailing needs of federal and provincial EPAs/ EPDs/ tasks and establish NIP Management Unit MOE for meeting the first two objectives are given below:

3.3.7.1. Establish by the beginning of 2011 a legally constituted coordinating mechanism for regular consultation among all stakeholders on implementation of the Stockholm convention

Table No. 3.3.7.1.1. Activities, indicators, responsibilities & resources

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of Consultant for advice and support to the implementing agency	Consultant hired	MoE/UNDP	6,000
2. Review existing legislation to incorporate provisions on importation, surveillance and management of POP Pesticides, registration of contaminated sites, responsibility and liability of owners of such sites and of wastes, monitoring of POP Pesticides and alternatives and environmental transport, fate and transformation	Reviewed version of the laws	MoE/EPA	2,000

3. Disseminate the popular versions of the law		MoE/EPA	1,000
		Total	9,000/-

Table No. 3.3.7.1.2. Time Frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
Acquisition of Expertise	MoE/UNDP												
Review existing legislation to incorporate provisions on importation, surveillance and management of POP Pesticides, registration of contaminated sites, responsibility and liability of owners of such sites and of wastes, monitoring of POP Pesticides and alternatives and environmental transport, fate and transformation	MoE/EPA												
Disseminate the popular versions of the law	MoE/EPA												

3.3.7.2. Develop by 2012 a program to strengthen the analytical capacity at selected existing laboratories for the proposed surveys, surveillance and monitoring programs for POPs, as related to NIP.

Table No. 3.3.7.2.1 Activities, indicators, responsibilities & resources

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of Consultant for advice and support to the implementing agency	Consultant hired	MoE/UNDP	6,000
2. Review relevant policies/legislation to incorporate monitoring of POPs	Monitoring provisions in relevant policies/legislation in place	MoE/EPA MINFAL	2,000
3. Prepare and implement capacity building plan for monitoring of POPs products, levels and impacts including establishment of specific monitoring database at 13 relevant institutions	Capacity building plan, Database actual reports in place	MoE/EPA MINFAL	50,000
4. Develop standards, procedures/guidelines for sampling and analysis of POPs	Standards and procedures/ guidelines in place	MoE/EPA MINFAL	10,000
5. Develop and implement strategy for the upgrading and accreditation of laboratories for research and monitoring	Strategy in place and Accredited Laboratories in place	MoE/EPA MINFAL	500,000

of POPs in food, environment and for human health surveillance			
6. Establish and implement comprehensive POPs monitoring programme involving strengthening of inspectorate services and customs at major entry points	Monitoring programme in place and Number of facilities and tools provided	MoE/EPA MINFAL	30,000
7. Develop monitoring mid year reports that involves site visits sampling and laboratory analysis	Reporting Format established and Monitoring reports	MoE/EPA MINFAL	10,000
8. Develop and implement capacity building program for federal and provincial EPAs/ EPDs	Capacity Building	UNDP-GEF MOE-EPA	1000,000
9. Establish and operationalize NIP Management Unit at Pak EPA/ MOE and keep operational for 5 years	NIPMU established and operationalized	UNDP-GEF MOE-EPA	500,000
		Total	65,000/-

Table No. 3.3.7.2.2. Time Frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Acquisition of Expertise	MoE/UNDP												
2. Review relevant policies/legislation to incorporate monitoring of POPs	MoE/EPA MINFAL												
3. Prepare and implement capacity building plan for monitoring of POPs products, levels and impacts including establishment of specific monitoring database at 13 relevant institutions	MoE/EPA MINFAL												
4. Develop standards, procedures/guidelines for sampling and analysis of POPs	MoE/EPA MINFAL												
5. Develop and implement strategy for the upgrading and accreditation of laboratories for research and monitoring of POPs in food, environment and for human health surveillance	MoE/EPA MINFAL												

Table No. 3.3.8.1. Activities, indicators, responsibilities & resources

Activities	Indicators	Responsibility	Resources US \$
1. Hiring of capacity building and training specialist to advice and support the executing agency	Consultant hired	MoE/UNDP	72,000
2. Preparation of separate training courses for workers, scientists, educators, technical and management personnel that can train them regarding POPs issue, their handling, sampling, analysis, monitoring, environmentally sound disposal, and remediation of sites	Courses prepared		90,000
3. Conducting training workshops (in country)			200,000
4. Seminars, Workshops, Courses, Conferences, Meetings (International)			300,000
		Total	66,2000

Table No. 3.3.8.2 Time Frame (Months)

Activities	Actors	1	2	3	4	5	6	7	8	9	10	11	12
1. Acquisition of Expertise	MoE/UNDP												
P2.Preparation of separate training courses for workers, scientists, educators, technical and management personnel that can train them regarding POPs issue, their handling, sampling, analysis, monitoring, environmentally sound disposal, and remediation of sites													
3. Conducting training workshops													

BIBLIOGRAPHY

1. Khan, N. 2004. Annexure Physical Verification of POPs Pesticide Stores in Sindh.
2. Sindh Environmental Protection Agency, Karachi.
3. GOP. 2003. Inventory of persistent Organic Pesticides. Environmental Protection Agency (EPA), Pujab, Lahore
4. Agha, H.U. and Khan, M.B. 2005. Proceeding of workshop on Persistent Organic Pollutants (POPs) Inventorization Process. 15 December, 2005. Environmental Protection Agency, NWFP
5. Hadi, N. U. 2004. POPs Pesticides Status in NWFP. Environmental Protection Agency, NWFP
6. Shoaib, N. 2004. Final Preliminary Inventory of Dioxin, PCB and Inventory of POPs Pesticide in Sindh Province. Environmental Protection Agency, Sindh.
7. Batur, M.A. 2005. POPs Pesticides Status in Balochistan. Environmental Protection Agency, Balochistan, Quetta
8. World Bank and CIDA. 2001. Persistent Organic Pollutants and the Stockholm Convention: A Resource Guide. Resource Futures International
9. FAO. 1997. Prevention and disposal of obsolete and unwanted pesticide stocks in Africa and the Near East. Second consultation meeting. Pesticide disposal series 5. Rome, 1997
10. FAO. 1996. Disposal of bulk quantities of obsolete pesticides in developing countries
11. FAO. 1994. Prevention and disposal of obsolete and unwanted pesticide stocks in Africa and the Near East. Rome
12. <http://www.infopak.gov.pk/profile.aspx>
13. <http://www.infopak.gov.pk/LandPeople.aspx>
14. <http://www.finance.gov.pk/survey/home.htm>
15. <http://www.ipen.org>
16. Javed A. Bhali et al, " Cytogenetic analyses of Pakistani individuals occupationally exposed to pesticides in a pesticide production industry," Mutagenesis, vol.21, No(2), pp 143-148(2006)
17. Tahir Hasnain, "Pesticides use and its impacts on crop ecologies: Issues and Options," Working Paper Series #. 42 Sustainable Development Policy Institute, Islamabad, Pakistan (1999)

18. Mahmood A. Khwaja, M.Rasool Jan and Kashif Gul, "Physical verification and study of contamination of soil and water in and surrounding areas of abandoned POP (DDT) factory in NWFP, Pakistan, Institute of Chemical Sciences, Peshawar University and SDPI (2006)
19. Naila Hussain, "Poisoned Lives: The Effects of Cotton Pesticides," Shirkat Gah, Lahore. Pakistan (1999)
20. S.J.H. Kazmi, T.Abbas and A.N. Hussain, "Obsolete Pesticides Dumps in Pakistan," Asia Toxic Campaigns, Greenpeace International/SCOPE, Karachi (1998)
21. Duhamel, A. "PCB decontamination and remediation technologies,". UNEP, Hanoi, Vietnam 16-19 March , 1999.
22. Mahmood A. Khwaja and Jindrich Petrlik " Alternatives for Persistent Organic Pollutants (POPs) Disposal," IPEN Fact Sheet, 2nd Revised Edition, Arnika – Prague, Czech Republic and SDPI - Islamabad, Pakistan, (2005)
23. Elmetec (Private) Limited, Lahore, March 23, 2003 (Personnel Communication).
24. Fielder, Heidi. Polychlorinated Biphenyls (PCB): Uses and Environmental releases. UNEP, Regional awareness raising workshop. Abhu Dhabi , UAE, 7-9 June 1998.
25. Greenpeace International. Investigating Pesticide and PCB stockpiles in developing countries: a manual for activists. Nov 19988, 1998
26. Khwaja, Mahmood A and Quraishi, Masood Hassan, "Self-Monitoring and Reporting for Industry," Sustainable Development Policy Institute, Islamabad 2003
27. KO-RAY-SHE, I - 9, Islamabad, March 27, 2003 (Personnel Communication)
28. D.Lester, Stephan. The toxicity of PCBs. Centre for health, environment, and justice; Falls church VA. May 1999
29. PAK HY Oils Limited, Karachi, March 28, 2003 (Personnel Communication)
30. Mahmood A. Khwaja and Jan Glavin, "Environmental and health impacts of PCBs and measures for PCBs phase out in Pakistan," Science, Technology and Development 2006 (submitted.)
31. Pakistan Environmental Protection Act, 1997
32. Stockholm Convention on Persistent Organic Pollutants (POPs), UNEP Chemicals, Geneva, March 2001
33. TRANS FAB, Lahore, April 14, 2003 (Personnel Communication) 2000
34. J.Digangi and J.Petrlik, "The Egg Report," www.ipen.org International POPs Elimination Network (IPEN), USA (2005)

35. Mahmood A. Khwaja and J.Petrlik, "Study on contamination of chicken eggs by POPs in Peshawar, NWFP, Pakistan," Arnika, Czech Republic and SDPI, Islamabad, Pakistan (April 2005)
36. WHO-ECEH and IPCS " Assessment of the health risk of dioxins: re-evaluation of the Tolerable Daily Intake (TDI)." WHO Consultation, Geneva, Switzerland. 1998
37. GOP/UNITAR, "National profile of chemical management in Pakistan," Pak-EPA/MoE, Islamabad. Pakistan October 2000
38. Fiedler, H., "Thailand Dioxin Sampling and Analysis Program", UNEP Chemicals, Geneva, Switzerland (2001).
39. WWF Pakistan 2001: Hospital Waste Factsheet. WWF Pakistan 2001.
40. GTZ-UIEP 1998: "Assessment of Existing Hospital Waste Management Situation in Selected Hospitals of Pakistan," SEBCON, Islamabad, Pakistan, 1998.
41. Mahmood A. Khwaja and J.Petrlik, " Study of POPs in different samples of hospital waste incineration and brick kilns residues in Pakistan," Arnika, Czech Republic and SDPI, Islamabad, Pakistan (May 2006)
42. UNEP: Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases. 2nd edition, UNEP Chemicals, Geneva May 2005
43. National Environmental Policy 2005, Ministry of Environment,, Government of Pakistan (2005)
44. Provincial POPs inventories, Pak-EPA/UNDP, Islamabad, Pakistan (2006)

PARTICIPIANTS OF POPS WORKSHOP HELD IN LAHORE

S. No	Name	Designation	Organization & Address	Contact Number
1	Mr. Kamran Ali Khan	D.G	EPA Punjab	042-9212597
2	Iftikhar Ahmad	District Officer Environment	Environmental Protection Agency Model Town , z- Block,H Street Daira Ghazi Khan	064-9260190 0333-6139299
3	Shafqat Saeed Farooqi	District Officer Environment	Environmental Protection Agency Punjab, 11-M.A Jinnah road Gujranwala	055-9200117 0321-4074934
4	Syed Wali Waheed	Director	WAPDA Environment Cell SMO Building, 3 Canal bank Mughalpura Lahore	042-6849506 03044077152
5	Muhammad Saleem Janjua	District Officer Environment Rawalpindi	City Distt Govt, Rawalpindi 101, lane 01, harley street rawalpindi cantt	051-9272280 0300-5507545 051-9272280

6	Ch. Ahmad Nadeem	Director (P&C)	EPA Punjab, 4-lydon rd Lhr	042-9212599
7	Rehana Kausar	Dy. Director	(Chemical/Enr) WAPDA, 194 WAPDA House Lhr	042-9202530
8	Mrs Amira Iftikhar	Dy Director Chemical	WAPDA 194-WAPDA House	042-9202530
9	Muhammad Shahid Hassan	Deputy Director (R&I)	EPA, 4-Lytton road, Lahore	042-9212436 0300-4807331
10	Abdul Islam	Field Assistant	Distt Officer Environmental Sialkot, E.P.D, Dashka Sialkot Village & Post Office Dholan Sialkot	4271291
11	Saima Barik	CRO	NIB, 47/2 Watan road lhr	0321-4021504

12	Shahid Naqvi	Information Officer (PRO) EPD	DGPR, 21-Mahmood Ghaznavi road Lahore	042-9201378 0301-4543229
13	Imtiaz Rasool Alvi	Distt Officer Environmen Sargodha EPA Punjab	Distt Officer Environmental New Setlite Town Y. Block, Sargodha	048-3212910 0300-4232434
14	Tahir Mahmood	Scout Leader	PR Sports Board, 262-E, St # 2, Mian Mir Colony, Lahore Cantt-54810	042-6364118 042-6308683 0345-4097877
15	Usma-Ul-Haq	Research Officer	EPA Punjab Lab,2-Lake Road Lahore	7237149 03004626266
16	Wajid Majeed Khan	Chemical Engineer	TR Workshop Pakistan WAPDA Foundation Shalimar Lahore, H: 528/A St: 26 Gulistan Colony, Mustafaabad LHR	042-9250116 03334417233

17	Dr. Ijaz Qureshi	Sr. Demonstrator	IPH (Institute of Public Health),153, Garden Block, New Garden Town Lahore	0300-9436373
18	Obaid Ullah	D.O.F Bahawalpur	EPA 32-S-36 New Islamia Park lahore	062-9250081 03014152009
19	Izhar-Ul-Haq	Inspector	EPA Punjab Distt Officer, Environment, Sialkot Muslim Colony Christian Town Sialkot	052-4271291 0302-6151137
20	M-Tahir Butt	S.O	CEPS, PCSIR Labs, Complex, S.O, CEPS, PCSIR labs Complex feroze Pur road Lahore	042-9230688-95 Ext-305 042-9230705
21	Rizwan Mahmood	Programme Officer	WorldWide Fund for Nature WWF-Pakistan Behind Ali Institute of Education, ferozepur road lahore	042-111993725 03009425080 042-5862358
22	Riaz Ahmad	Research Assistant	Environment Protection Department (LABS) Liquid Waste Section, 2-Lake road Lhr	042-7237149 0302-4009166

23	Moeen Qamar	Senior Engineer	NESPAK, I-C Block-N Model Town ,Lhr	042-9090637
24	Anwar Hussain Mujahid	General Manager	National Engineering Services Pvt, Ltd Pakistan 158-E/1 Johar Town Lhr	042-9090645
25	Muhammad Ahmad	Assistant Director	EPA Punjab,4-Lytton road Lahore	042-9212436
26	Fayaz Ali Qureshi	Assistant Director(CFIA)	EPA Punjab 4-Lytton road Lahore	042-9212599
27	Muhammad Irshad Nagi	Disttrict Officer Environment	Environment, District Officer Environment Highway Colony, G.T. Road Gujrat	03004829205 9260146
28	Muhammad Bashir Khan	Director	EPA NWFP, SDU Building Khyber Road Peshawar	091-9210263 03219121063 091-9212800

29	Aamir Munir	Sr. Engr	NESPAK, 1-C, Block-N, Model Town , Lahore	042-9090458 0321-4484900 042-9231926
30	Zarar Haider	Director	Industries Deptt, Government of Punjab- Lahore Poonch House Multan road, Lahore	042-9211520 0303-7596022 042-9211522
31	Dr. Mazhar Mushtaq	Senior LCT	Biochemistry Department UCMD The University of Lahore IKM Thobar Niaz Baig Lhr	0321-9454013
32	Ahsan Sattar Sheikh	Asst. Professor	Institute Of Molecucal Biology &Biotechnology The University of lhr 1-km Thocan Niaz Baig, Raiwind Road Lahore 54000	042-5411901 0322-4058338 042-5413036
33	Prof. Dr. M Saleem Shuja	Rector	The University of Lahore, 1-Km raiwind Road Lahore	042-5411901 0300-4671799 042-5413036

34	Mahtab Ahmad	Senior Scientific Officer	Centre for Environment Protection Studies, PCSIR Laboratories Complex, CEPS, PCSIR Labs Complex Ferozpur road, Lahore	042-9230688-95 03004637639 042-9230705
35	Muhammad Tariq	Junior Scientific Officer	Centre for Environmental Protection Studies PCSIR Lab Complex Ferozpur road Lahore	042-9230710 0334-9817251 042-9230705
36	Fiaz Ahmad	Research Assistant	Environmental Protection Agency, Environment Impact Assesment) 4-Lyton road Lahore Punjab	042-9212599 0334-6990715
37	Abdul Qayyum Athar	Scientific Officer	PCSIR Labs Complex ACR Centre PCSIR Lahore	042-9230688-95 Ext: 316 0321-4521405
38	Dr. Abdul Wahid	Assistant Professor	Botaony Department GC University, Lahore	0300=9690504

39	Ali Abbas	Research Officer	EPA- 4-Lytton Road Lahore	042-9212436
40	Asim Shahzad	A Reporter	Daily Express 48/N Gulburg 1 lahore	042-5878700 0300-8417836
41	Munis Siddiqui	Manager	Siemens Pakistan Engg.co Ltd 2 nd Floor, State Life Bldg, Davis Rd. Lahore	042-6370938 0300-8238276 042-6370932
42	Muhammad Saleem Abbas	Research Assistant	Environment Protection Department, Air Pollution Laboratory, 2-Lake Road Lahore	042-7237149 0302-4328500
43	Ajmal Nadeem	Research Assistant (AP)	Envieronmental Protection department, 2-Lake road Lahore	042-7237149 03024247279

44	Ilyas Khan Lashari	Team Leader	Development Visions, Social House Kidarpur, Munchinabad Distt Bahawal nagar	0632751384 0333-6300706 0632751384
45	M Naeem Khan	Scientific Officer	PCSIR Lab. Lahore,ACRC, PCSIR Lahore	042-9230688 0333-4235308 042-9230705
46	Muhammad Mansha	PHD Student	Chemical Engr Deptt UET Lahore GT Rd UET Lahore	042-6829488 0333-484732
47	M. Khalid Iqbal Khichi	Scientific Officer	CEPS, PCSIR Lab Lahore , CEPS PCSIR Lab Ferozepur road lahore	042-9230688- 95 0345-7606210 042-9230705
48	Dr. Altaf Hussain	ADD Director(MSDC)	Directorate general of Health Cooper Road Lahore, 24 –Cooper road Lahore	042-92001139 03004323761
49	Amina Zafar	Lecturer in Environmental Sciences Deptt Lahore	LCWU, Lahore College for Women University Lahore Jail Road	042-9203091 0304-7363616

50	Malik Muhammad Yousaf	Dy. Director	Agriculture Deptt , 4-D, Lytton Road LHR	042-7311107 0300-4675969
51	Tariq Mahmood	Assistant Director	Punjab Agricultural Development & Supplies Cooperation (D) 4-D, Lytton Road Lahore	042-7311107
52	Muhammad Yousaf	Budget and Account Officer	EPA, 4-Lytton road Lahore	042-9212437 0301-4159514
53	Shahid Asad	Producer	Aaj TV, 56 The Mall Lahore	111-010-010 0333-4788821 03334381450 042-6368749

54	A Amir Sohail	Camraman	AAj TV Lahore, 56 the Mall Lahore	111-010010 03004745908 0426367317
55	Fahim Nasir	Distt Officer	Environment Sahiwal Environmental Protection Agency Punjab Lahore, 274 Maukal Colony EPA Sahiwal, Noor Shah Colony Noor Qureshi Hospital Sahiwal	0333-6878606
56	Ghulam Abbas Qureshi	Research Assistant	EPA Punjab, 2-Lake road Lahore	042-7237149 03004670800
57	Anif Mehmood	Inspector	Environmental Protection Agency Sheikharpur DCP Complex (EDO(W&S))	056-9200176 0333-4712024
58	Javed Iqbal Mehir	Manager	Hospital Waste Management, C/O Shalimar Hospital Lahore	111-205-205 0300-4680060

59	Junaid HabibUllah	Director	Hospital Waste Management, C/O Shalimar Hospital Lahore	042-6818388
60	Muhammad Azhar Iqbal	D.O Environment Kasur EPA	EPA near Walli Hospital District KSR	049-9250197 0300-4108392
61	Muhammad Younis Zahid	Inspector Environment	Environment Department City Distt Government Lahore	042-9212751 0300-4404321
62	Mrs Farah Deeba	Scientific Officer	Environment Centre CEPS, PCSIR Laboratries Complex Lahore centre for Environment Protection Studies PCSIR Labs Complex Lahore	042-9230710 0333-4559815
63	Farzana Bashir	Scientific Officer	CEPS, PCSIR Labs Complex ferozepur road Lhr centre for Environmental protection Studies PCSIR Labs Complex, Ferozepur road LHR	042-9230688- 95 0300-8820500

64	Mrs Naz Imtiaz	Senior Scientific Officer	Pakistan Council of Scientific and Industrial Research labortries Lhr centre for Environmental Protection Studies	9230688-95 Ext 225
65	Ammara Habib	Scientific Officer	CEPS, Pakistan Council of Scientific and industrial Research, Lahore Centre for Environmental Protection Studies, PCSIR Labortries Complex, Fero road	9230688-95 Ext 306 03044130301
66	Tayyab Aftab	Senior Scientific Officer	Centre for Environmental Protection Studies PCSIR Labs Complex Lahore	9230710 0300-8811731
67	Masood Ur Rehman	Photografer APP Lahore	Associated Press of Pakistan	03004244427
68	Rub Nawaz Bajwa	Staff Reporter	APP 1-A LDA Flats China Chowk Lahore	9201566-7 0300-9434964 9201563
69	Rafi Ahmad	Student	Govt College University Lhr, 185-A Johar Town Lhr	0345-4182818

70	Madeeha Chaudhry	News Correspondent ARY One World	65/4 Abid Majeed Road, Cantt	6667714 0333-4622662
71	Muhammad Asghar	Reporter	DAWN, Lahore	042-5758120-25 0300-4887107 042-5711879
72	Sardar Arshad Iqbal	M.Phil research Student	Batony Department GCU, Lahore	0300-5109604
73	Syeda Bushra Waheed	Consultant Environmental Expert	Barqaab (WAPDA) Hydroplanning Organization WAPDA, 5/view, Zohra Kashmir road	9202720 0300-4598553
74	Muhammad Farooq Alam	ADCRs/RO	EPA, 2-Lake Road Lhr	7237149 0301-4211409
75	Nazir Awan	News Reporter	ATV, 11 F Model Town Lahore	042-5853669 0333-4506028 042-5853668

76	Umer Bajwa	Student	Govt College University (GCU), House 584, Block – F, Johar Town Lahore House No: 584, Block-F, Johar Town Lahore	0300-4678218
77	Waqas Barik	Student	Govt, College University (GCU) Lhr H-2Sakhisultan street, Itihad colony Sheraz Park, Allama Iqbal Town, Lahore	0321-9106007

**PARTICIPANTS OF POPS WORKSHOP HELD ON 18TH SEP'06 AT
KARACHI**

S.No.	Name	Desig nation	Organizati on and Address	Contact No.
1	Hafeez Rehman	PRO to Advisor to Chief Minister for Environment	Sindh Secretariat	0304-2216727
2.	Syed----- Ali	Private Secretary to Advisor to CM Sindh	7 th floor, Secretariat Building	Not Specified
3.	Shamsul Haq Memon	Ex-Secretary Environment		Not Specified
4.	Waqar Hussain Phulpoto	Dy. Director, SEPA Sukkar	A-36, S.C.H.S. Airport road, Sukkar	Not Specified
5.	Abdul Majid Khan	Deputy Director, Agriculture :Ext: Karachi		021-9232174
	Ashfaq_____ __ number 30	Deputy Director	EPA, Sindh	

6.	Mashood Ahmed	Assistant Director	EPA Sindh	0300-307054
7.	Qurban Ali	Assistant Director	EPA Sindh	Not Specified
8.	Rehanuddin Ahmed	District Officer, Agriculture :Ext: Karachi		021-9232174
9.	Syed Ali Hadi Raza	Section Officer	Agriculture Department Sindh Secretariat, Tughalaq house-2, Karachi.	Not Specified
10.	Aman Memon	Section Officer, Agriculture Department		021-9211690
11.	Kamran Shahzad	Envoirmentali st	Hamdard University, Karachi	Not Specified
12.	Muhammad Saleem Jalbani	Planning Officer (Environment)	Planning and Development Department Karachi.	Not Specified

13.	Kishan Chand Mukwana	Admn. Incharge EPA Sindh	EPA Regional Office Hyderabad	022-9240196 0304-2810129
14.	Dr. Mansoor Imam		Sir Syed University Engg. & Tech. Karachi	4988000-5 ext. 339 0300-2291521
15.	Dr. Sema Tahir	PRI-PARC		0300-2691643
16.	Dr. Raza			Not Specified
17.	Dr. Ahsan	Industrial Technologist	NEAC	Not Specified
18.	Dr. Nabi Sial	Professor	Agriculture University Tandojan	0300-3190383
19.	Dr. Alia Munshi	PSO	PCSIR Labs Complex	021-4650785

20.	Dr. M. Mustafa	Pathologist		021-5218449
21.	Dr. Qamar ul Haq	Assistant Professor	Federal Urdu university, Karachi	0300-3971472
22.	Iffat Mehmood	Assistant Professor	Federal Urdu University	021-6678827 0334-3469367
23.		Assistant Professor	Federal Urdu University, Karachi	021-4823373 0333-2158489
24.	Sohail A. Soomro	Assistant Professor	U.E.T.	0304-2812294
25.	Mukhtiar Ahmed		SEEDA Khairpur Mirs Saidh	0300-3181901
26.	Mohammad_	27 th number	Karachi University	0302-2749947
27.				

28.	Ko Mei-Fong	Agriculturalist (Private)	B-8 Bridge Apartments Frere Town	Not Specified
29.	Ghulam Murtaza	Lecturer (Deptt. Soil and Sciences)		0302-3973077
30.	Jawad Butt	Chemist	Hamdard University, Karachi	0300-8979833
31.	Hina A. Siddiqi	Scientific Officer	PCSIR, Labs Complex Karachi	021-4650785
32.	Sohail Qureshi	ICI/PPTA		021-4730212
33.	Mr. Amjad Ali Mahmood	Chemist GSP	St. 17, Block-2 Ghulshan-e-johar, Karachi	Not Specified
34.	Allah Wadhayo Gaudabi	Lecturer	SAU, tandojan	0302-3002421
35.	Nafisa Shoaib	S.E.PA.(Cons ultant)	A/84, Block 9, Yasinabad 7.B,Area	Not Specified

36.	Farhan Ilyas	Reporter	GEO NEWS	
37.	G. Sarwar	Cameraman	PTV News	Not Specified
38.	Tariq Aziz	P.P.I		0333-2352081
39.	M. Ahmed			Not Specified
40.	Asif Hussain	Daily NEWS		0300-9252053
41.	Adil Jawad	Reporter	Daily Express	0304-2111142
42.	Asad Ullah	Reporter	The News 5 th Floor Al- Rehman Building Karachi	Not Specified

43.	Gul M. Naizi	Reporter	Daily Khabrain	0300-2217571 5805201-5
44.	Naseer Bukhari	Journalist	Affair Magazine, Karachi	Not Specified
45.	Shahnawaz Akhtar	Reporter	Daily Business Recorder	0333-3084336
46.	Mukhtar Alam	Reporter	Daily Dawn	0300-9215912
47.	Hina Ali	Reporter	The Nation	021-5846622
48.	Anjum Alam	Reporter	Not Specified	0333-2261373
49.	Ahmed Hanan	Student Institute of Environment Studies	A-153, Refa-e-Aam Society, Karachi	021-4589401

50.	Farzana Naseem	Student Institute of Environment Studies Karachi	H# N-2/A, st. 13, Dalmain National Stadium Road, Karachi	021-4992487
51.	Tahira Satiar	Student Institute of Environment Studies Karachi	H# 366Rexer colony Mayhopir Road Karachi	Not Specified
52.	Hena Khalid	Student Institute of Environment Studies Karachi	C-28, Block E, North Nazimabad Karachi	Not Specified
53.	Shazia Ansari	Student Institute of Environment Studies Karachi	L-1583 Block I, Metrovicc III Ghulshan-e-Iqbal, Karachi	Not Specified
54.	Sher Afzal	Student Institute of Environment Studies Karachi	Institute of Environment Studies Karachi	Not Specified
55.	Omair	Student Institute of Environment Studies Karachi	Institute of Environment Studies Karachi	Not Specified

56.	Akhtar Ali		Porplan Consultancy	5838081-2
-----	------------	--	------------------------	-----------

PARTICIPIANTS OF POPS WORKSHOP HELD IN BALOCHISTAN

S.No	Name	Designation	Organization & Address	Contact Numbers
1	Mushtaq Ahmad Khan	Director General	Arid zone research Centre(PARC) Brewery Road Quetta	081-2853620
2	Zakaria Nasir	Managing Director	Social Care Organization	0333-7803565
3	Mehboob Ali	Assistant Director	Environmental Protection Agency Balochistan Office of DG EPA Samngli road Quetta	081-9201840
4	Roomana Gul Kakar	Deputy Director	Agricultures Department Qta,C-46 G.O.R	081-2453583
5	Muhammad Rahim	Project Engineer	City Distt Govt. Quetta	0819202272
6	Ihtisham Kakar	Executive Director	BRDRS , Balochistan Rural Development & Research Society Arbab town Samngli road Quetta	081-2003176 0333-7818478

7	Nasir Ali Bangash	Chief Engineer QESCO	QESCO house Zarghoon road Quetta Cantt	081-9202292 0333787283
8	Engr. Muham mad Khan Uthmankhail	Assistant Director	EPA Balochistan	081-9202484 03337803543
9	Dr. Hafiz Mohammad Rafiq	Director Health Services(P.H)	Health Department, DGHS Office, Sarib Link road Quetta	0819211353 03337850990
10	Fahim Shikh	Dy Director	Industries & Commerce, Govtt of Balochistan	091-9211160
11	Husnain Raza	D/G, DPR	Public Relat Department, Quetta Balochistan	081-9201615 0300-3905226
12	Dr. Hussain Baloch	Director Prov Health Directorate	Health Department	081-9211356
13	Rahila Durrani	MPA	House No. 28 A Anscomb Rd Quetta	081-9203265 03009381899

14	Mazhar Iqbal Shaikh	Project Manager	Management Development Programme, National Engineering Corporation 52-B ,Jinnah Town, Sammungli road Quetta balochistan	081-2829235 03332163149
15	Zaigham Ali	Executive Officer	Forest Sibi, EDO Forest Sibi	0833-9230165 03337815131
16	Muhammad Afzal	Director	Technology Transfer Instt PARC at ARI Sariab Quetta	081-9211212 0333-7839817
17	Muhammad Riaz Khan	Deputy Director	PCRWR , WRRRC Quetta, 43 Gul Town PO BOX 304 Quetta	081-9202418 0333-7921775
18	Jalaluddin Qureshi	Director	PCRWR, 47 Gul Town, P.O. Box 304 Quetta	081-9202418 0333-7816382
19	Eng. Abdul Jabbar Khan	Director	PCRWR, 47 Gul Town P.O.Box 304 Quetta	081-9202418 0333-7842047
20	Sohail Anjum	PA To Director	PCRWR, 47, Gul Town , P.O.Box 304 Quetta	081-9202418 0321-2608363

21	Nawab Khan Nasar	Lecturer Botony	C/O Botony Deptt University of Balochistan Quetta	081-9211264 0333-7958224
22	Abdul Salam	Social Worker	Sulehri Street Spinny road Quetta	
23	Ali	Social Worker	Sulehri Street Spinny road Quetta	
24	AsadUllah Bhatti	Producer Current Affairs PTV	Producer PTV Quetta	091-9201049 0333-7921048
25	Jalil Khan	Dy Director	QESCO HQ	081-9201873 0302-3848058
26	Noor Khan	Dy Director	Public Relation Govt of Balochistan	
27	Maqbool Hassan	Range Forest Officer	Forest and Wildlife department Balochistan Quetta	081-53610539 03337869842
28	Muhammad Latif	Divisional Forest Officer	Research , Quetta 7-64/6 Alamdar road Quetta	081-9201137 0819201139

29	Ms.Sajida Qureshi	Principal	Govt. Poly Tech Institute for girls, New C-1- Wahadat Colony Brewery Road Quetta	081-9211629 03337822642
30	Abdul Qayyum Bedar	Producer PTV	Pakistan Television Corporation Quetta centre	081-9201049 0333-7810545
31	Muhammad Ali Batur	Section Officer(Environment)	Environment , Sports&youth Affairs deptt. Govt. of Balochistan, Block - 7, Room# 24 Balochistan Civil Secretariate Zarghoon road Quetta	081-9203270 03337800604 081-9202421
32	Akbar Oryal	Project Director Agr	Agriculture Department Rani Bagh Saryab road Quetta	081-9211578 0321-8012488
33	Sher Ahmed	Senior Naib President	Sarwar Welfare Society Kands distt Mastang	0843-700884 0301-3773742
34	Arshad Ghani Khan	Lecturer	Balochistan Agriculture College, BAC Chaman road Beleli, Quetta	081-2880-192 03003834087 2880-306

35	Dr. Syed Shahid Ali	Foreign Professor (ENVS & Toxicology)	Higher Education Commission (HEC) Univ. of Balochistan, Inst of Bischem	0333-7811833
36	Dr. Rasool Bakhsh Tareen	Professor Chairman	Department of Botony U.O.B Quetta	081-9211264 03337925404
37	Muhammad Amin	Lecturer	Balochistan Agriculture College ,20/21 Gulistan road Quetta Cantt Bolan hotel	081-88912 03003818858
38	Fayaz Ahmad	Cameraman	GEO TV	03204790396
39	Imran Malik	Social Organizers	URBAN Basic Services5 E 11 Zarghoon Town Quetta	081-9201854
40	Mr. Muhammad Rehman	Goodz Constructor	New zarghoon road Quetta	081-2441523 03458380973
41	Dr. Hussain Baloch	Director Prov. Health	Health Directorate Quetta	081-9211356

42	Balach Aziz	Deputy Secretary	Social Welfare department Civil Secretriat	081-9202783
43	Zawar Ali	Ps to Secretary Environment	Environment deptt	081-9202421
44	Zain Ullah Khan	Town Officer (B&F)	Zarghoon Town Quetta	081-9201997 0345-8379577
45	Abdul Rehman	Sports (B&F)	Zarghoon Town Quetta	081-9201997 0202-3949593
46	Mazhar Iqbal Shaikh	Project Manager	NEC Management Development Programme, 52-B Jinnah Town Quetta	081-2829235 0333-2163149
47	Zakria Nasir	Managing Director	Social Care Organization	0333-7803565
48	Zahoor Ahmad	Lecturer	U.O.B Quetta	081-9211264 03337939320

49	Dr. Talat Zamir	Associate Professor	University of Balochistan Quetta	081-9211266 0334243599
50	Dr. Muhammad Islam	Research Expert	ICARDA, Arid zone Research Cuttr Quetta International Cuttr for Agricultural research in dry areas	081-2855010 0333-7805308
51	Sher Ahmed Bangulzai	Information Officer	Information Departmental Balochistan, DPR Quetta	081-9201615 0300-3894535
52	Saadat Ali	Reaserch Assistant EPA	EPA Office Samangli road Quetta	081-9201840 9201180
53	Babar Hilal Ahmad Abbas	Assistant Professor	CASVAB, Brewery road Quetta	081-2843853 0321-8038047
54	Imran Hassani	Lecturer	CASVAB-University of Balochistan, CASVAB Brewery road Quetta	081-2853843 03003819356
55	Murtaza Baig	News Producer	PTV Quetta	081-9201188 0300-8381639

56	Pulwash Noor	Student	Govt. Girls Degree College Quetta C-46 G.O.R Colony Quetta	081-2834956
57	Dr. Muhammad Nawaz	Professor(TTS)	Zoology Deptt Balochistan University Quetta	081-9211548 03015909039
58	Mohammad Rahim Qamarbani	Project Engineer	City Distt Govt Quetta	081-9202272
59	Talib Hussain Magsi	T.M.O	Zarghoon Town Quetta	081-9201697 03003811552
60	Mohammad Asif Kasi	Programme Manager	Participatory Integrated Development Society (PIPS), 11-A Chaman housing Scheme Quetta	0812846224 03003884119
61	Dr. Hafiz Muhammad Rafiq	Director Health	Health depttD.G.H>S Health Services Sariab link road Quetta	081-9211353 0333-7850990
62	Abdul Karim Mengal	President	The WEEDS Naseebabad near SSP D.M Jamal the Needs society Nasirabad Balochistan near SSP	0838711170 0301-3698088

			Office	
63	Fahim Sheikh	Dy .Director	Industries & Commerce Govt of Balochistan	081-9211160
64	Dr. Mufakhirah Durrani	Associate Professor	Botony Department Balochistan University Quetta	081-9211264
65	Hasnain Raza	R/O	Public Relates Officer DPR Office Quetta	081-9201615 03003905226
66	Nasir Ali Bangash	Chief Engineer QESCO	QESCO (WAPDA), QESCO House Zarghoon road Quetta Cantt	081-9202292 0333787283

PARTICIPIANTS OF POPS WORKSHOP HELD IN PESHAWAR

S.No.	Name	Designation	Organization Address	Contact Numbers
1	Dr.Hamad Awais Agha	DG EPA	3 rd Floor, Old Courts Building, Khyber Road NWFP Peshawar	091-9210421
2.	Dr.Muhammad Bashir Khan	Director	3 rd Floor, Old Courts Building, Khyber Road NWFP Peshawar	091-9210263 03005979823
3.	Mohammad Ali Khan	Assistant Director	EPA ,3 rd Floor Courts Building Khyber Road Peshawar	091-9210263 0321-9009857
4.	Liaqat Ali Khan	Deputy Director (Planning)	3 rd Floor, Old Courts Building Khyber Road, Peshawar	091-9210282 03005955161
5.	Dr. Sana Ullah Khattak	Director	Nuclear Institute for Food & Agriculture (NIFA) Tarnab Peshawar	
6.	Haji Ghulam Ali	District Nazim	NWFP Peshawar	091-9211464 03008599696

7.	Dr. Hussain Ahmad	Deputy Director	EPA-NWFP-Peshawar	091-9210966
8.	Shams Ur Rahman	Chief Analys/DD Lab	EPA- NWFP- Peshawar	0919210282 03339136744
9.	Wajid Khan	Monitoring Inspector	EPA-NWFP-Peshawar	091-9210421 03005838052
10.	Dr. Amjad Ali Khan	Deputy Director	EPA-NWFP-Peshawar	091-9210148 0333-9322510
11.	PRO to Minister Environment	PRO to Minister Environment Information Department	Directorate Of Information, Khyber Road Peshawar	091-9210252-9210193 03009325496
12.	Fazal-e-Rabbi	District Officer Agriculture	Distt Officer Agriculture Peshawar P.O Peshawar University	091-9216379 03009599787
13.	Javed Ur Rehman	Registrar C/O D.G.EPA Peshawar	Environmental Protection Tribunal NWFP-Peshawar	091-2252704 0333-9184559

14.	Siraj Anwar Khan	Assistant Director	City Development & Municipal Complex Ph-5 Hayatabad	091-9217026-029 0301870-8470
15.	Nosheen Tayaab	Assistant Director, Provincial Science Academy	Pakistan Provincial Science Academy NWFP-Peshawar	091-9216283
16.	Baseer Khan	Chief of Section (Green Sector)	Planning & Development Department Government Of NWFP Peshawar	091-9210432
17.	Dr. Abdur Rahman Khan	Principal Scientific Officer	PCSIR Labs. Complex NWFP-Peshawar	091-9216234 0300-5936171
18.	Muhammad Tahseen Aslam	Scientific Officer PCSIR	PCSIR Labs Complex, Jamrud Road Peshawar-25120	091-9216240-2 0333-4852433
19.	Mian Atta Uddin Kakakhail	Plant Pathologist	Agriculture Research Institute Tarnab, Peshawar	091-2964191 03339169303

20.	LiaqatUllah Mian	Entomologist	Agriculture research Institute Tarnab ARI- Tarnab Entomologist FATA Peshawar	091-2964191 091-2964097
21.	Muhammad Din	Photographer Minister Environment	Information department, Directorate of Information Khyber Road Peshawar	091-9210185 03349125030
22.	Dr. Mohammad Ishaq	Associate Professor	Institute of Chemical Sciences University of Peshawar	091-9216652 03005974255
23.	Dr. Ihsanullah	DCS/ Head Food Sciences division NIFA	NIFA/PAEC, Tarnab Peshawar	091-2964796 0321-9015292
24.	Mohammad Sajjad	PRO To Minister Environment	Information department, Directorate of Information Khyber Road Peshawar	091-9210185 03009325465
25.	Fazl-e-Rabbi	Distt officer Agriculture Peshawar		091-9216379 0300-9599787
26.	Minhas Uddin	Assistant Meteorologist	Pakistan Metrological department, Pakistan, regional meteorological Centre Peshawar	091-9210184 03025946469

27.	Dr. Amjad Ali Khan	Deputy Director EPA	EPA Government of NWFP Peshawar	091-92101485 0333-9322510
28.	Javaid Ur-Rehman	Registrar Environmental Protection/ C/O D.G EPA Peshawar	EPA Govt of NWFP	091-2252704 0333-9184559
29.	Noor Ul Hadi	Environmental Engineer	Halcrow, Zero Point Islamabad	051-2203451-5 03005933717
30.	Dr. Abdus Sattar	Head Entomology Division	Nuclear Institute For Food & Agriculture (NIFA) tarnab P.O Box No. 446 Peshawar	091-2964796 0333-9111335
31.	Dr. Fida Mohammad	Associate Professor	National Centre for Excellence in Physical Chemistry University of Peshawar	091-9216766 03459096807
32.	Gul Nawab	P.S	IRNUM Peshawar	091-9216114 03005953194
33.	Abdus Saeed Shah	Pr. Scientist PAEC IRNUM Peshawar	PAEC IRNUM P.O University Campus Peshawar	0919216114-7 Ext 153 03025523116

34.	Iram Mughal	Programme Officer- PARD	PARD Pakistan Academy for Rural Development Peshawar	091-9216274- 9216200-3
35.	Sadia Nawaz	Project Coordinator	Environmental Protection Agency , 3 rd Floor, SDU Building, Khyber Road Peshawar Cantt	091-9210148 0300-5910565
36.	Nilofar	VETS Coordinator	Environmental Protection Agency 3 rd Floor SDU Building Khyber Road Peshawar Cantt	091-9210148
37.	Dr. Sana Ullah Khattak	Director	Nuclear Institute for Food & Agriculture (NIFA) Tarnab	091-2964058 0300-8590530
38.	Wajid Khan	Monitoring Inspector EPA	3 rd Floor, Old Courts Building Khyber Road Peshawar Cantt	091-9210421 03005838052
39.	AbduR Rauf Khan	Administrator	Pakistan Environmental Protection Foundation Peshawar 13-B Abdarra Road University Town Peshawar	091-9216945
40.	Mohammad Ali Khan	Assistant Director EPA Peshawar	EPA NWFP 3 rd Floor, SDU Building Khyber Road Peshawar	091-9210263 03219009857

41.	Eng. Saeed Gul	Assistant Professor UET Peshawar	Deptt of Chemical Engineering, NWFP UET Peshawar	091-9218180 03005972518
42.	Siraj Anwar Khan	Assistant Director	City Development & Municipal Department Commercial Complex Ph-5 Hayatabad	091-9217026-029 Ext-360 03018708470
43.	Azmat Ullah Khan	Chief (M&E)	P&D Department NWFP Peshawar	091-9210448
44.	Dr. Fayaz Ud Din Qazi	Agriculture Officer	Agriculture Extention, Directorate of Agriculture Extention University Road Peshawar	091-9216379
45.	Dr. Mohammad Aslam Khan	Instructure in Agriculture	Pakistan Academy for Rural Development (PARD) Peshawar University Town near Sherpao Hospital	091-9216200-2 03014733945
46.	Syed Mubarak Ali Shah	DEO Wildlife	NWFP Wildlife deptt Forest Office Shami Road Peshawar	091-9212084
47.	Muhammad Ramzan	Assistant Professor	Deptt of Agriculture Machanization Agri University	091-9216448

48.	Adeel Saeed	Reporter APP	Associated Press of Pakistan (APP) Laila Tower Near Qayyum Stadium Peshawar Cantt	091-52763143 0321-9040701
49.	Muhammad tahseen Aslam	Scientific Officer	PCSIR labs Complex, jinnah Road Peshawar-25120	091-9216240-2 0333-4852433
50.	Eng. Shah Nawaz Khan	Hony President	Pakistan Environmental Protection Foundation (PIPF) 13-B Abdara Road University town Peshawar	091-9216945 0302-5506187
51.	Qayum Nawaz	Plant Physiologist	Agriculture Physiologist, Agriculture Research Institute Tarnab, Peshawar	091-2964031 0302-8088480
52.	D. Ghulam Sabir Shah	Entomologist	Agri. Research Tarnab Peshawar	091-2964031 03219068654
53.	Mohammad Ali Khan	Staff Correspondent	The News, Peshawar	091-5271512 0301-8805700
54.	Mohammad Irshad	Monitoring Inspector EPA	Khyber Road peshawar	091-9210421 0333-9198705

55.	Prof. Dr. Farman Ullah Khan	Professor	Agriculture University , deptt of Soil and Environmental Sciences NWFP Peshawar	091-9216548
56.	Dr. Sarir	Professor/Chairman	NWFP Agricultural University Peshawar(Soil & Environ. Social)	091-9216548
57	SallaUddin	Assistant Director	CD&MD, PDA House Phase -1 hayatabad	091-9217026-28 0300-5933299
58	Abdul Quddoos	Assistant Director (Planning)	CD&MD, DDA Office Phase -5, Hayatabad	091-9271026—28/350
59	Zia Ur. Rahman	Assistant Director	PDA, 289-H-I Phase -11 Hayatabad	091-9217026 03339107220
60	Zohra Gul Khalil	Student	Department of Environmental Sciences,	0333-9063142
61	Dr. Taj Ali Khan	Associat Professor	NWFP UET Peshawar Deptt of Agricultural Engi.	0301-8993556

62	Dr. Hussain Ahmad	Deputy Director	EPA-NWFP-Peshawar	091-9210966
63	Azmat Ali Awan	Research Officer	Pak Oil seed development Board Tarnab, Tarnab Form Peshawar	0333-9124224 091-2964254
64	Dr. Kanwar Suleman	Director Frest product research Division	Pakistan Frest Institute Peshawar	091-9216137-9218398
65	Shams Ur Rahman	Chief Analyst/DD Lab EPA	EPA-NWFP-Peshawar	0919210282 03339136744
66	Rahman Ullah Jan	Photographer	Daily Jang, F-86 Saddar Road Peshawar Cantt	0915273173 03005950541
67	Engr. Ishaq Ahmad	Assistant Professor	Deptt of `mining Engir NWFP UET Peshawar	091-919216796Ext-3146l 0333-9268854
68	Fauzia wahab	Student	Department of Environmental Sciences University Of peshawar	03009034952

69	Dr.Zahir Shah	Professor	Agriculture University Peshawar (Soil & Environmental Sciences)	091-9216772 03005915341
70	Dr. HamidUllah Shah	Professor Chairman	NWFP Agricultural University Peshawar (Deptt of Agricultural Chemistry)	091-9216903- 03005935576
71	Salman Akbar	Marketing Executive and Site Engineer	Scientific & Medical Concern, 10-A-Rahman Plaza Khyber Bazaar Peshawar	091-7112925 0301-8803596
72	Khalil Muhammad	Dy. Director	PESCO, WAPDA House Shami Road Peshawar	091-9210987 03009327840

For Official Use Only (Not for Distribution)



POPs Enabling Activity Project

Government of Pakistan
Ministry of Environment
Islamabad



ANNEXURES (VOL I)

Inventories

NATIONAL IMPLEMENTATION PLAN (NIP)
FOR
PHASING OUT AND ELIMINATION OF
POPS FROM PAKISTAN
UNDER STOCKHOLM CONVENTION
ARTICLE 7 (a)

POPs Enabling Activity Project, Ministry of Environment, Islamabad.

POPS PESTICIDES

INVENTORIES

PAKISTAN

SUMMARY OF POPs–PESTICIDE STOCKPILES IN PAKISTAN

S. No	Province	Sites	Quantity (MT)
1.	Punjab	167	3800
2.	Sindh	205	2016
3.	NWFP	32	49
4.	Balochistan	5	136
5.	AJK	3	31.5
6.	Northern area	2	0.5
	Pakistan	430	6033

POPs PESTICIDES

INVENTORIES

PUNJAB

PUNJAB

Table-8 District wise Distribution of POPs, Unknown and Mixed Pesticides

District	Aldrin	Dieldrin	Endrin	DDT	Chlordane	Heptachlore	Toxaphane	Total POPs	Unknown pesticides	Mixed
Attock	---	---	---	---	---	90	---	90	3635	800
B.Nagar	400	---	---	2830	---	3510	150	6890	22280	100
B.Pur	---	---	---	300	---	---	---	300	4100	---
Bhakkar	---	95	400	600	---	---	200	1295	5850	300
Chakwal	---	---	---	---	---	---	---	---	---	---
D.G Khan	---	---	---	---	---	---	---	---	---	---
F.Abad	---	20	20	650	---	490	---	1180	8910	1075
Gujranwal	---	---	---	2445	---	2000	---	4445	18630	6430
Gujrat	---	---	---	3890	---	---	---	3890	4069	12000
Hafizabad	---	---	---	1125	---	1920	---	3045	2500	3140
Jhang	---	---	---	325	---	20	---	345	8966	---
Jhelum	---	---	380	---	---	270	---	650	5200	---
Kasur	---	---	---	---	---	---	---	---	---	---
Khanewal	---	---	---	---	---	---	---	---	1860	3500
Khushab	---	67.5	---	900	---	120	---	1087	1896	150
Lahore	---	---	---	---	---	---	---	---	---	---

District	Aldrin	Dieldrin	Endrin	DDT	Chlordane	Heptachlore	Toxaphane	Total POPs	Unknown pesticides	Mixed
Layyah	---	---	---	---	6255	---	---	6255	3270	---
Lodhran	---	---	---	70	---	---	---	70	3520	3500
M.B Din	---	120	---	4285	---	---	---	4405	11124	4110
Mianwali	---	140	---	2760	---	---	100	3000	9175	2500
Multan	---	---	---	---	---	---	---	---	2395	10035
M. Garh	---	---	---	---	---	600	---	600	1655	3000
Narowal	---	---	---	---	---	---	---	---	7880	---
Okara	---	---	---	---	---	---	---	---	---	---
Pakpattan	---	---	---	60	---	1080	---	1140	331	6500
R.Y Khan	---	1250	---	4050	---	88	---	5388	---	---
Rajanpur	---	---	---	---	---	12445	---	12445	10630	---
Rawalpindi	---	---	---	---	---	---	---	---	---	---
Sahiwal	---	---	---	1640	---	20	---	1660	850	200
Sargodha	---	20	---	4700	---	2090	---	6810	---	2796
Sheikhupura	---	---	---	---	---	---	---	---	60	---
Sialkot	---	120	---	275	---	480	---	875	15835	21290
T.T Singh	---	---	---	1350	---	---	---	1350	---	5400
Vehari	---	40	---	---	---	---	---	40	18320	4500
Total	400	1473	800	32255	6255	25223	450	62956	188972	90486

Table-1 Generic and Commercial Names of Organochlorine Pesticides

Generic name	Commercial name
DDT	DDT
Heptachlor	Clorahep, Heptagran
Aldrin	Aldrite, Drinox
Chlordane	Mata-arriera
Hexachlorobenzene	HCB
Dieldrin	Dieldrite
Endrin	Hexadrin
Mirex	Dechlorane
Toxaphene	Toxakil, Strobane-T



Fig-1 Location of stores of Obsolete Pesticides in Punjab
Source: [Punjab Urban Environment Project, 1992]

Table-3 Location of Obsolete Pesticides Stores in Punjab

r.No.	District Name	Location
	Attock	<ol style="list-style-type: none"> 1. O/O EADA(Ext.) Attock.. 2. AO Markaz Hasanabdal O/O FA Burhan. 3. AO Markaz Hazro O/O FA Nartopa 4. Fateh Jang Store at O/O FA Gali Jageer Fatehjang. 5. O/O AO Markaz Jand. Pindigheb. 6. AO Markaz Thatta O/O FA mathial. 7. AO. Markaz Pindigheb o/o FA Khour.
	Bahawalpur	<ol style="list-style-type: none"> 8. AO.Markaz Pindigheb O/O FA. Mianwala. 2. Mubarakpur. Ahmadpur East.
	Bahawal nagar	<ol style="list-style-type: none"> 1. Madrissa Store in O/O DDA, Bahawalnagar 2. O/O AO. Dunga Bonga. 3. O/O EADA Minchinabad. Minchinabad. 4. O/O AO. Mandi Sadiq Gunj. 5. Tehsil Store Haroonabad at Yateemwala.
		<ol style="list-style-type: none"> 6. Faqirwali near Grain Market. 7. O/O EADA Fortabbas, Near Jhana More. Fortabbas 8. O/O EADA (Ext.) Chishtian. Chishtian. 9. AO store Dahranwala.

	Bhakkar	<ol style="list-style-type: none">1. O/O AO. Notak. Bhakkar.2. O/O EADA (Ext.) Bhakkar. Bhakkar.3. Mankera Store at Chak No.67/ML Mankera.4. O/O AO Darya Khan. Bhakkar.5. O/O EADA Farida Garden Kaloor Kot. Kaloor Kot.6. AO. Jandanwala Store. Kaloor kot.7. Dullewala store. Kaloor kot
--	----------------	---

	Faisalabad	<ol style="list-style-type: none"> 1. O/O AO. Chak Ram Dewali 2/JB Faisalabad. 2. A.I. Store Jaranwala. Jaranwala. 3. AO. Store Khurianwala, Jaranwala. 4. AO. Store Satiana, Jaranwala. 5. Rodala. Jaranwala. 6. FA Store 101 GB Jaranwala. 7. FA. Store 64-GB Jaranwala. 8. FA. Store 644/GB, Lundianwala. 9. FA Office/Store 108 GB Awagat. 10. FA Store 561 GB, Jaranwala. 11. 498/GB FA. office store, Summundri. 12. Office/Store of FA. 506/GB, Summundri. 13. Office/store of 226/GB, Summundri. 14. Office/store of FA. 228/GB, Summundri. 15. Office/store of FA.452/GB, Summundri. 16. Office/store of FA 448/GB, Summundri. 17. Office/store of FA.205/GB, Summundri. 18. Office/store of FA 468/GB, Summundri. 19. Office/store of FA 441/GB, Summundri. 20. Office/store of AO. Tandlianwala, Summundri. 21. Office/store of FA. 410/GB, Summundri.
	Gujranwala	<ol style="list-style-type: none"> 1. Attawa Store at Gujranwala. Gujranwala. 2. Eminabad (FA. Store) Gujranwala. 3. Mann (U.C. Qila Didar Singh) Gujranwala. 4. Gondlanwala (Ali Pur Road) Gujranwala. 5. Aroop(FA Store), Gujranwala. 6. Wazirabad (AO. Store) O/O EADA (Ext.) W.bad 7. Sadhoki (FA. Store) on G.T. Road,

		<p>Kamokee.</p> <p>8. Whando (AO. Store) O/O AO. Whando, Kamokee.</p> <p>9. Ali Pur Chattha (FA Store), Kamokee.</p> <p>10. Karyal Kalan (FA. Store) NosheraVirkan.</p> <p>11. Nokhar (FA store), NosheraVirkan.</p>
	Gujrat	<p>1. AO. Gujrat at Awan Colony. Gujrat.</p> <p>2. AO. Karianwala, Gujrat.</p> <p>3. AO. Lala Musa. Kharian</p> <p>4. AO. Kharian at Beganwala, Gujrat.</p> <p>5. AO. Dinga at Jani Chak, Gujrat.</p> <p>6. AO. Sarai Alamgir, Gujrat.</p> <p>7. AO. Kotla Arab Ali at Chindanwala, Gujrat.</p>
	Hafizabad	<p>1. Hafizabad (AO Store) Hafizabad.</p> <p>2. Vaniey Tarrar (AO. Store) Hafizabad</p> <p>3. Pindi Bhattian (FA Hqr. Store), Pindi Bhattian.</p> <p>4. Jalalpur Bhattian FA. Store, Pindi Bhattian.</p> <p>5. Thatah Kheru Matmal FA Store, Pindi Bhattian.</p> <p>6. Sukheke (AO) Store), Pindi Bhattian.</p>
	Jhang	<p>1. Lalian Store, Grain Market, Lalian. Chiniot.</p> <p>2. O/O AO. Bhowana Chiniot.</p> <p>3. Markaz Bhaddana O/O FA Pir Panja. Chiniot.</p> <p>4. O/O EADA (Ext.) Shorkot. Shorkot.</p>
0	Jhelum	<p>1. O/O DDA(Ext.)Jhelum. Jhelum.</p> <p>2. O/O AO (Ext.) Dina. Jhelum</p> <p>3. O/O EADA(Ext.) Pind Dadan Khan. P.D. Khan.</p>

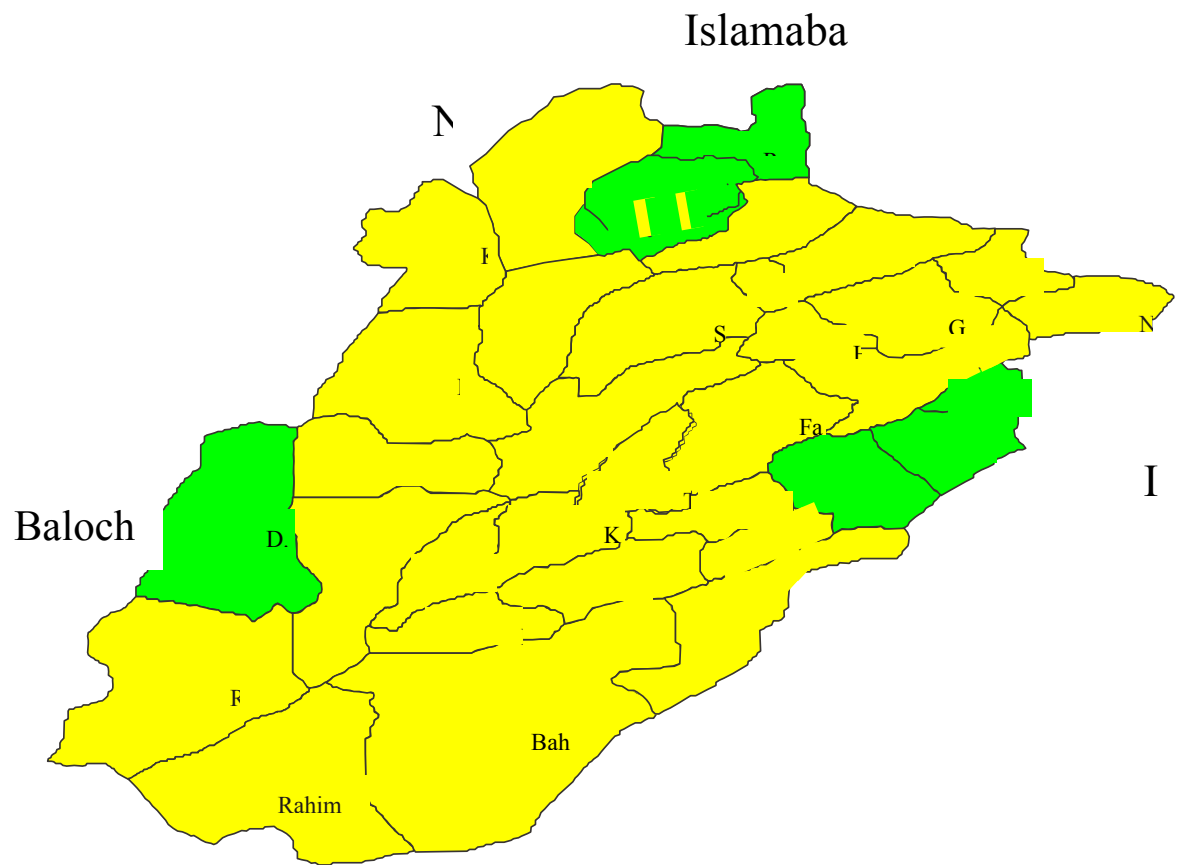
1	Khanewal	<ol style="list-style-type: none"> 1. Chak No.83-85/10-R Govt. Farm Khanewal 2. O/O EADA/FA Store Khanewal. -do- 3. O/O EADA Mian Chanu. Mian Chanu.
2	Khushab	<ol style="list-style-type: none"> 1. O/O AO. Khushab, Khushab. 2. O/O AO. Quaid Abad, Khushab. 3. O/O AO. Mithatiwana, Khushab. 4. Block No.6 Near o/o EADA Johrabad, Khushab.
3	Layyah	<ol style="list-style-type: none"> 1. District/Tehsil PP store chowk Azam road, Layyah.
4	Lodhran	<ol style="list-style-type: none"> 1. O/O EADA (Ext.) Lodhran. Lodhran. 1
5	Mandi Bahauddin	<ol style="list-style-type: none"> 1. AO. Mandi Bahauddin. Mandi Bahauddin. 2. AO. Phalia. Phalia. 3. AO.Parianwali, Phalia 4. AO. Qadirabad at Phekhu, Phalia 5. AO.Miana Gondal. Malakwal. 6. FA. Kathiala Sheikhan Malakwal. 7. FA Malakwal at Gojra Malakwal. 8. FA Malakwal at Chak Raibi Malakwal.
6	Mianwali	<ol style="list-style-type: none"> 1. O/O EADA(Ext.) Mianwali. Mianwali. 2. ML Piplan Farm. Piplan. 3. O/O EADA (Ext.) Isakhel. Isakhel
7	Multan	<ol style="list-style-type: none"> 1. Government Agri Farm Old Shujabad Road, Multan. 2. Basti Khanpur Shujabad. Shujabad.

8	Muzafargarh	1. District PP store, Chah Mianwala D.G.Khan Road, Muzafargarh.
9	Narowal	1. O/O EADA(Ext.) Narowal. Narowal. 2. O/O FA Sansgary Zafarwal. Narowal. 3. Badomalhi/Main Bazar Badomalhi. Narowal. 4. O/O FA Raiba Kalan. Shakargarh. 5. O/O FA Bna, Shah Ghareeb Road. Shakargarh.
0	Pak Pattan	1. Government Nursery Farm Pakpattan. Pak Pattan. 2. O/O AO. (Ext.) Arifwala. Arifwala.
1	Rahim Yar Khan	1. O/O EADA (Ext.) R.Y.Khan, R.Y.Khan. 2. Chak 103-P, R.Y.Khan. 3. Chak 108-P, R.Y.Khan. 4. Kot Samaba, R.Y.Khan. 5. Akramabad, R.Y.Khan. 6. Kot Haq Nawaz, R.Y.Khan. 7. Chak139/P, R.Y.Khan. 8. Chak 114/P, R.Y.Khan. 9. O/O AO. Zahir Pir. Khanpur. 10. O/O AO. Bagho Bahar, Khanpur 11. O/O EADA Liaquatpur. Liaquatpur. 12. O/O. AO. T.M. Pannah, Liaquatpur
2	Rajanpur	1. Tehsil PP store Rojhan City, Rojhan. 2. Tehsil PP store Bismillah Colony, Rajanpur. 3. Tehsil PP store O/O EADA(Ext.). Jampur.
3	Sahiwal	1. O/O EADA (Ext.) Chichawatni. Chichawatni.

4	Sargodha	<ol style="list-style-type: none"> 1. O/O FA 47-NB Sargodha. 2. O/O FA 97-NB Sargodha. 3. O/O FA 93-NB Sargodha. 4. O/O FA 103-NB Sargodha. 5. O/O FA 67-NB Sargodha. 6. O/O FA Silanwali. Sargodha. 7. O/O FA 46-SB Sargodha. 8. O/O FA 82-SB Sargodha. 9. O/O AO Bhagtanwala Sargodha. 10. O/O FA Marri Sargodha. 11. O/O FA 75SB. Sargodha. 12. O/O EADA, Bhalwal. Bhalwal. 13. O/O AO. Phulrawan. Bhalwal. 14. O/O AO. Kot Moman Bhalwal. 15. O/O AO. Jhawrian. Shahpur 16. O/O AO. Sahiwal. Shahpur 17. O/O AO. Farooqa. Shahpur 18. O/O AO. Shahpur, Shahpur 19. O/O AO. Gondal, Shahpur
5	Sheikhupura	<ol style="list-style-type: none"> 1. AO. Store Kot Abdul Malik at O/O EADA (Ext.) Ferozewala. Ferozewala. 2. O/O Field Assistant Bhattal. Sheikhupura.
6	Sialkot	<ol style="list-style-type: none"> 1. Pakki Kotli, Sialkot Tehsil Sialkot. (FA store) Sialkot. 2. FA store, Bootter Sialkot 3. FA store, Jorrian. Sialkot 4. FA store, Sheni. Sialkot 5. FA store, Adalat Garh, Salkot 6. FA store, Rasool Pur Palian, Sialkot

		<ul style="list-style-type: none"> 7. Tehsil Store, Pasroor. Pasroor 8. Daska store at Adamkey. Daska. 9. Sambrial store at Malkanwla, Daska 10. AO store Satrah, Daska
7	T.T.Singh	<ul style="list-style-type: none"> 1. Store of AO. Kamalia. Kamalia. 2. Store of AO., Pir Mahal near Sheikh Cloth House, Kamalia 3. Store FA. 434 JB Gojra. Gojra. 4. Store FA.370 JB Gojra. 5. Store FA. 281 JB Gojra.
8	Vehari	<ul style="list-style-type: none"> 1. Store Market Committee Danewal Vehari. Vehari. 2. O/E EADA (Ext.) Mailsi. Mailsi. 3. Markaz Com: P.M. Chak NO.535/EB Chichawatni Road, O/O EADA (Ext.) Burewala.
		Grand Total 167

Figure-2 below indicates the location of these 167 stores in various districts of Punjab



Districts having Stores of POPs Pesticides

Districts having no stores of POPs Pesticides

Fig-2 Location of Stores of Persistent Organic Pesticides in Punjab

Table-4 indicates the top five districts of the Punjab having maximum numbers of the obsolete pesticides.

Table-4: Top Five Districts of Punjab Having the Highest Number of Stores

Districts	Numbers of Stores
Faisalabad	21
Sargodha	19
Rahim Yar Khan	12
Gujranwala	11
Sialkot	10

However, review of the various studies and book entries and physical survey conducted during process of inventorization of POPs pesticides still indicated the presence of number of stores of obsolete pesticides stores in thickly populated areas in major cities. Table-5 below indicates the list of plant protection stores which are located in thickly populated areas of Punjab

Table 5: List of Plant Protection Stores Located in Thickly Populated areas in Punjab

S. No	Location	Kg/ Litre		Directorate of Agri. Extension
1	Divisional Store Bakarmandi, Lahore	10,000		Lahore
2	F.A. Chiniot	40,800		"
3	EADA, Shorekot.	18,000		"
4	Jaranwala Proper	16,000		"
5	Summandari Proper	23,600		"
6	Gujranwala	74,000		"
7	Okara	18,700		"
	Sub. Total		<u>201,100</u>	
8	Government seed farm Multan	25,700		Multan
9	Vehari	23,700		"
10	Khaniwal	14,000		"
11	Sahiwal	93,000		"
12	Khanpur	11,400		"
13	Bahawalpur	42,100		"
	Sub. Total		<u>209,900</u>	
14	The. And District Store Muzafargarh	27,887		D.G. Khan
15	Jampur EADA Store	18,432		"
	Sub. Total		<u>46,319</u>	
16	Mianwali	21,085		Rawalpindi
17	A.O. Isa Khali	14,640		"
18	A.O. Bhakkar	18,720		"
	Sub. Total		<u>54,445</u>	
	G. Total	<u>511,764</u>	<u>511,764</u>	

4.2 Quantities and Storage Conditions of Obsolete Pesticides in Punjab

Responsibility of distribution of pesticides among the farmers in Punjab was transferred to private sector in 1980. Although these stores were remained locked but physical surveys of these stores in various districts indicated poor containment and storage conditions.



Corrosion of Metallic Drums



Variation
in the available

Tearing of Poly Bags and Littering of Obsolete Pesticides

record and quantities of the pesticides is common. Corrosion of metallic drums, tearing of poly bags, leakages, evaporation, spillages, littering and illegal and underhand sale are prominent factors which have resulted in significant variation in quantities of obsolete pesticides in stored in these stores.

Table-6 indicates variations in quantities of obsolete pesticides in 12 stores.

Table- 6: Quantities of Obsolete Pesticides in Punjab (Comparison between different surveys)

Stores	Quantity* (Book Entries)	Quantity* (Scoping Inventory) (Proplan, 1997)	Quantity* Physical Survey (Gtz, 1998)
Lahore store	25.0	13.00	5.0
Gujanwala/A tova	35.3	9.00	9.6
Gujanwala/ Kamoke	10.0	9.00	9.5
Sadigabad	80.0	45.00	20.3
Khanpur	29.0	19.55	27.5
Bahawalpur	34.0	23.80	10.1
Hasilpur	14.0	13.00	16.6
B.Nagar-II	18.0	14.36	15.3
B.Nagar-I- EADA	8.0	7.00	11.7
Sahiwal	80.0	48.00	63.0
Okara	17.0	13.50	36.7
Chiniot	25.0	9.90	6.1
Total	375.3	225.11	231.4

All the Quantities are in tons

Under present Persistent Organic pesticides inventORIZATION process, study of various records and physical survey indicated the presence of obsolete pesticides, known pesticides, Persistent Organic Pesticides, unknown and mixed pesticides in 28 district of Punjab.

Table-7 indicates the breakup of total obsolete pesticides and fraction of known pesticides lying in these stores.

Table-7: Quantities of Total Obsolete Pesticides and known Pesticides

Sr. No	Districts	Total Obsolete Pesticides kg/ltr	Total Known Pesticides kg/ltr
1	Attock	9150	4625
2	B.Nagar	66050	36780
3	B.Pur	22943	18543
4	Bhakkar	35699	28254
5	Faisalabad	21567	11402
6	Gujranwal	82134	52629
7	Gujrat	35263	15304
8	Hafizabad	89828	81143
9	Jhang	23153	13842
10	Jhelum	14951	9101
11	Khanewal	16000	10640
12	Khushab	12735	9602
13	Layyah	29667	20142
14	Lodhran	9157	2067
15	M.B Din	35783	16144
16	Mianwali	43771	29096

17	Multan	14530	2100
18	M. Garh	15996	10741
19	Narowal	17300	9420
20	Pakpattan	8654	683
21	R.Y Khan	67643	42565
22	Rajanpur	26842	3767
23	Sahiwal	8427	5717
24	Sargodha	80078	70470
25	Sheikhupur a	10848	10788
26	Sialkot	78442	40442
27	T.T Singh	14838	8088
28	Vehari	44320	21460
	Total	935769	585555

Chakwal, D.G Khan, Kasur, Lahore, Nankana Sahib, Okara and Rawalpindi have no store of obsolete pesticides. Whereas Table-8 indicates category wise quantities of POPs pesticides, unknown and mixed pesticides. Out of nine (9) Persistent Organic Pesticides Mirex and Hexachlorobenzene (HCB) were not found in any of the district of the Punjab. Whereas highest tonnage of 32.255 of DDT is present in the province. Moreover presence of 188.972 tons of unknown pesticides and 90.486 tons of mixed pesticides are presenting more worsening situation in the field of management of POPs pesticides in Punjab. Table-9 indicates quantities of the POPs pesticides, mixed and unknown pesticides in Punjab.

Table-9 Categories of Quantities of POPs, Unknown and Mixed Pesticides in Punjab

Sr.No.	POPs	Total Quantity kg/ltr
1	Aldrin	400
2	Dieldrin	1873
3	Endrin	800
4	DDT	32255
5	Chlordane	6255
6	Heptachlore	25223
7	Toxaphane	450
8	Mirex	0
9	HCB	0
10	Total Pops	62956
11	Unknown pesticides	188972
12	Mixed Pesticides	90486

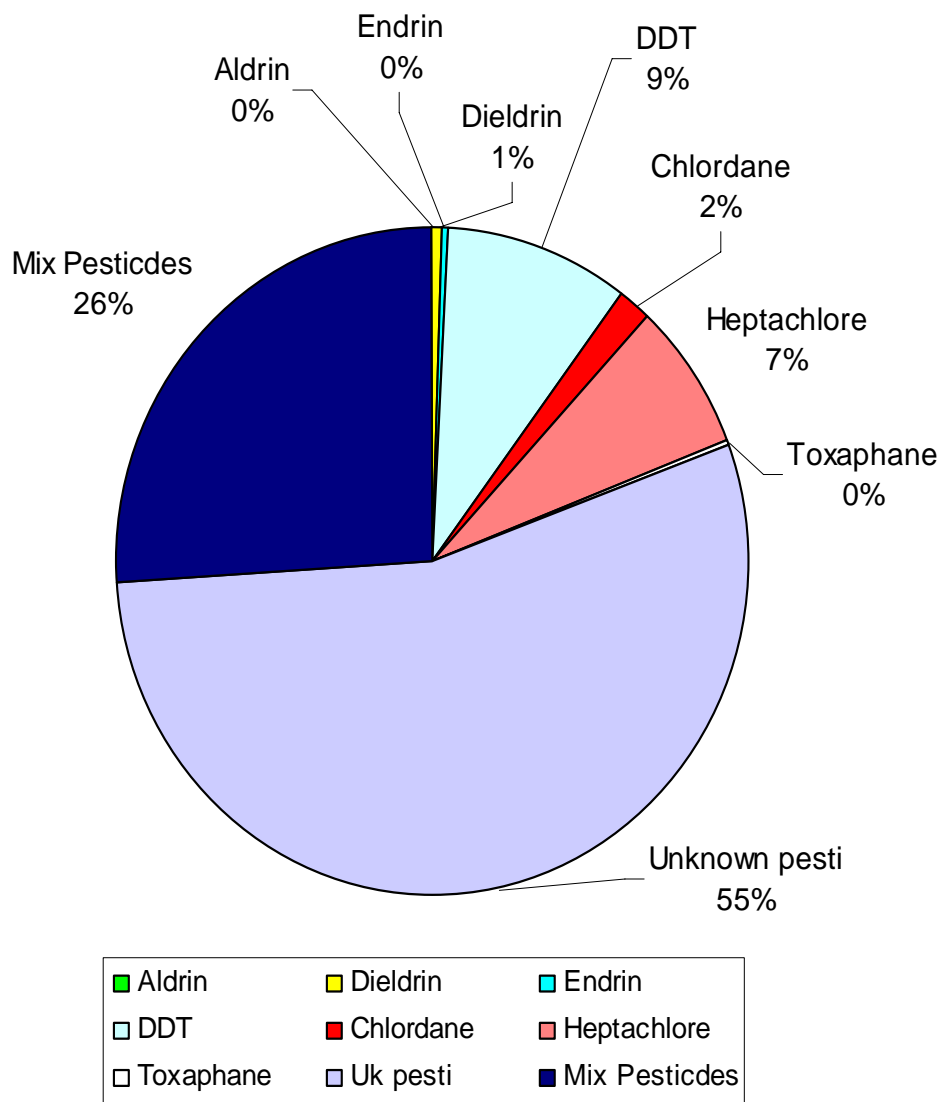


Figure-3 Status of Obsolete Pesticides in Punjab

References

1. Murphy S. "Toxic effects of pesticides", in C. Klaassen, M. Amdur, J. Doull, ed., Casarett and Doull's Toxicology. New York: Macmillan Publishing Company, 1986
2. Pakistan, 16 May 1996 on the basis of information provided by the Pakistan Agricultural Pesticides Association
3. <http://archive.greenpeace.org/pressreleases/toxics/1998nov10.html>
4. Punjab Urban Environmental Project", Scott & Furphy Pvt.ltd, NESPAK, EPA, Punjab, Lahore, 1992.
5. Survey of obsolete pesticide stocks in Punjab & Sind (summary) The Royal Netherlands Embassy Pakistan September 1997[5]
6. "Physical Survey in Pakistan" site visit report and proposal for the removal of obsolete pesticide stocks in the provinces of Punjab, Sind and Baluchistan --- GTZ, Federal Republic of Germany. 1998.[6]

Quantities of obsolete pesticides in Punjab (comparison of different survey)

Store	Quantity (Book Entries)	Quantity (Scoping Inventory) (Proplan, 1997)	Quantity physical survey (Gtz, 1998)
Lahore store	25.0	13.00	5.00
Gujranwala/atova	35.3	9.00	9.6
Gujranwal/kamoke	10.0	9.00	9.5
Sadikabad/	80.0	45.00	20.3
Khanpu	29.0	19.55	27.5
Bahawalpur	34.0	23.80	10.1
Hasalpur	14.0	13.00	16.6
B. Nagar II	18.0	14.36	15.3
B. Nagar I EADA	8.0	7.00	11.7
Sahiwal	80.0	48.00	63.0
Okara	17.0	13.50	36.7
Chiniot	25.0	9.90	6.1
Total	375.3	225.11	231.4

Categories of quantities of POPs unknown and mixed pesticides in Punjab

S. No	POPs	Total Quantity Kg/Ltr
1	Aldrin	400
2	Dieldrin	1873
3	Entrin	800
4	DDT	32255
5	Chlordane	6255
6	Heptachlore	25223
7	Toxaphane	450
8	Mirex	00
9	HCB	00
10	TOTAL POPs	62956
11	Unknown pesticides	188972
12	Mixed pesticides	90486

Quantity of total obsolete pesticides and known pesticides in Punjab

S. No	District	Total Obsolete pesticides Kg & Ltr)	Totla Known pesticides (Kg & Ltr)
1	Attock	9150	4625
2	Bahawalnagar	66050	36780
3	Bahawalpur	22943	18543
4	Bhakar	35699	28254
5	Faisalabad	21567	11402
6	Gujranwala	82134	52629
7	Gujrat	35263	15304
8	Hafizabad	89828	81143
9	Jhang	23153	13842
10	Jehlem	14951	9101
11	Khanewal	16000	10640
12	Khushab	12735	9602
13	Layyah	29667	20142
14	Lodhranh	9157	2067
15	MB Din	35783	16144
16	Mianwali	43771	20096
17	Multan	14530	2100
18	Muzafargharh	15996	10741
19	Narowal	17300	9420
20	Pakpatan	8654	683
21	RY Khan	67643	42565
22	Ranjanpur	26842	3767
23	Sahiwal	8427	5717
24	Sargodha	80078	70470
25	Sheikhupura	10848	10788
26	Sialkot	78442	40442
27	TT Singh	14838	8088
28	Vehari	44320	21460
Total		935769	585555

POPs PESTICIDES

INVENTORIES

SINDH

SINDH

Pesticides

STATEMENT SHOWING THE LOCATION, AND QUANTITY OF EN-EFFECTIVE POPs PESTICIDES LEFTOVER WITH THE DEPARTMENT OF AGRICULTURE

PROVINCE SINDH 1979-1980

No	NAME OF STORE	QUANTITY OF POPS PESTICIDES	QUANTITY	TOTAL
LEFTOVER IN HYDERABAD				
DISTRICT				
1.	Divisional store			
	Workshop Hyderabad	1. BHC 10% Dust	95,500 kgs	95,500 kgs
2.	Tando Allahyar			
	ADA office	1.DDT 25% EC	23850 litre	
		2 .BHC10% Dust	100 kgs	
		3.BHC6% Gr	136-36 kgs	24086.36
3	Tando Mohammed			
	Khan ADA office	1. BHC 10% Dust	3510 kgs	3510 kgs
4.	Tando Mohammed			
	Khan ADA office	1.BHC 12% WP	8272 kgs	
		2 BHC10% Dust	125 kgs	8397 kgs
5.	Field Assistant	1. BHC 6% Gr	136-36 kgs	136.36 kgs
	Somar Ki Marm			
	Tal: T.M.Khan.			

DISTRICT KARACHI			
1. Provincial store	1. Heptachlore	6800.00 Litre	
Malir city	2. Heptachlore	8600.00Litre	
	3.Dieldrin 20%	25.0Litre	15425 Litre
2. Landi Farm.	1. Dieldrin	9.0 Litre	9.0 Litre
3. Main store	1.Dieldrin	36 Litre	36 Litre
Malir Karachi			
DISTRICT : THATTA			
1. Jheric	1.DDT WP 50	25.45 kgs	
	2. DDT 75% WP	127.27 kgs	
	3.BHC 12% WP	29.45 kgs	
	4. BHC 5% Dust	101.80 kgs	
	5. Heptachlor 20% Gr	50 kgs	333.97 kgs
2. Thatta	1. Dieldrin 19.5 EC	24.5 Litre	
	2. BHC 12% WP	34-67 kgs	
	3. DDT 50% WP	483.08 kgs	
	4. BHC 60% Gr	.15 kgs	
	5. DDT 75%WP	25.0 Kgs	
	6. BHC 12% Dust	51.00 kgs	
	7 .BHC 5%Gr	200 kgs	818.4 kg
3.Thatta HQ	1. BHC 12% WP	3540-55 kgs	
	2. BHC 6% Gr	704.54 kgs	

	3. BHC 12% Dust	599.09 kgs	
	4. DDT 75% WP	687.27 kgs	
	5 .DDT50% WP	203.65 Kgs	
	6 .Heptachlor	500 kgs	6235.1 kg
4. Ghora Bari	1. Heptachlor 20%	50 kg	50 k
5. Chour Jamali	2. DDT 50%	136.0 kg	136.0 k
6.Mirpur Bathoro	1.BHC 6%	532.69Kg	
	2.BHC 12%	45.45 kg	
	3. DDT 75%	99 kg	
	4. DDT 50%	152.73 kg	829.87 kg
7.Gora Bari	1 DDT 75 SP	247.72 kg	247.72 k
8. Var	2. BHC 6%Gr	181.81 kg	
	3. DDT 75%	76.36 kg	258.17 kg
9.Sujawal	1.DDT 75%WP	101 kg	
	2.BHC 5% Gr	45 kg	
	3.Dieldrin 20% EC	50 Litre	
	4 .BHC 12%WP	45.45	241.45 kg
10.Gharo	1.BHC 12% WP	1443.81 kg	
	2.BHC 6% Gr	6976.77 kg	
	3.BHC 5% Gr	226.80 Kg	
	4.Heptachlore 40%	45.36 Kg	
	5.DDT 75%	204.12 kg	
	6.Endrin 20% EC	168.20 Litre	
	7.Dieldrin 20% EC	50 Litre	9115.06 kgs
11.Sujawal	1.BHC 6% Gr	1137.50 Kg	
	2.DDT 75%Gr	405 kg	

	3. BHC 5% Dust	450 kg	
	4.Aldrin 40% EC	450 Litre	2442.5 kg
12.Banno	1.Aldrin 40% EC	6.75 Litre	
	2.BHC 12% Dust	32.77 kg	
	3.DDT 50% WP	127.22 kg	
	4.Endrin 5%	159.11 Kg	325.85 kg
13.Darro	1.BHC 12% WP	2084 kg	
	2.BHC 6% Gr	508.01 kg	
	3.BHC 5% Dust	509.09 kg	
	4.DDT 75% WP	454.54 kg	
	5. DDT50% WP	1527.22 Kg	
	6.Dieldrin 205 EC	25 litre	5107.8
14.Ghullamulah	1.BHC 12%WP	53 kg	
	2 DDT 75% WP	84 kg	
	3. Heptachlore 20%	25 kg	162 k
15.Mirpur Bathoro	1.BHC 12% WP	158.6 Kg	
	2.BHC 6% Gr	772.72 kg	
	3BHC 5% Dust	182 kg	
	4.DDT 75% WP	136.36 kg	
	5 DDT 50%	204 Kg	
	6.Dieldrin 20% EC	277-05 Lt	
	7.Heptachlore 20% Gr	50 kg	1780.73kg
16.Chatho Chand	1.BHC 10% Dust	98.18 kg	
	2.BHC 6% Gr	90.92 kg	99.10k
DISTRICT BADIN			
1.District Store	1.Heptachlore 20% Gr	45.44 kg	

Badin	2.BHC 10% Dust	6785.50 kg	
	3.BHC 12% WP	110.98 kg	
	4. BHC 5% Dust	8.93 kg	
	5.DDT 50%WP	1960 kg	
	6.BHC 5% Gr	1590 .75 kg	10501.6 k
2.F.Asstt: U/C			
Soerani	1.BHC 5% Dust	68.18 kg	
	2.Dieldrin 20% EC	36.4 kg	104.58 k
3.Luwari Sharif			
	1.Toxaphine 8% EC	34.85 Lt	
	2. BHC 12% WP	96.82 kg	
4.P.A. U/C Kadhan			
	1. BHC 5% Dust	110.9 kg	110.9k
5.P.A. U/C Nao Shar			
	2. BHC 10% Dust	250 kg	250 k
6.Agri: officer Colarchi			
	1.DDT 75% WP	45.5 kg	
	2.Endrin 2% Gr	45.5 kg	
	3.Heptachlore 5% Gr	2006 kg	
	4.BHC 5% Gr	68.1 kg	
	5.BHC 12%	15391 kg	
	6.BHC 10% Dust	225 kg	
	7.BHC 12% WP	1000 Kg	18781.1 kg
7.Karyo Gahawar			
	1.BHC 5% Gr	45.45 kg	
	2.BHC 12% WP	15.45 kg	60.9 k
8.F.Asstt: U/C. T.G.Ali			
	1.DDT 50% WP	280.12 kg	
	2.BHC 10% Dust	750 kg	
	3. BHC 5% Dust	150 kg	1180.12 k
9.F.A.U/C Sudho			
	1 DDT 50% WP	337 Kg	337 kg
Kambrani			

10.Agri: officer	1.BHC 12% WP		2550.4 kg
T.Bago	2.BHC 5% Dust		1336.36 kg
	3.DDT 75% WP		764.54 kg
	4 Endrine 5% Gr	92 kg	4743.3 kg
THARPARKAR DISTRICT			
1.District store	1.DDT 25 EC		8.67 Litre
Mrpurkhas	BHC 5G		22 kg
	Endrine 5 G	22 kg	52.67 kg
2.District H.Q.	Heptachlor		50 kg
Mirpurkhas	DDT		48.63 kg
	Heptachlor		13.3 kg
	BHC 12%		17.27 kg
	DDT 75		112 kg
	DDT 75		46 kg
	DDT powder		41.73 kg
	Heptachlor	65.98 kg	394.98kg
3.Jhilori	DDT 75		176.36 kg
	Heptachlor	254 kg	430.36kg
4.Junejo Farm	DDT		15 kg
Sindhri	DDT 25 EC		13.5 Litre
			28.5 kg
5.Mirpur (old)	BHC 12WP		76 kg
	BHC 6G		310 kg
	DDT 5 WP		13 kg
	BHC Dust	30 kg	429 kg
6.Kot Ghulam	BHC 5 G		151 kg

Mohammed	BHC 6 G	666 kg	81kg
7.A.O. Digri	BHC 5 G	724-01 Kg	
	Heptachlor 20 G	50 kg	
	DDT 75 WP	351.88 Kg	1125.89kg
8.A.O.Tando	BHC Dust	127 kg	
Jan Mohammed	DDT EC	18.5 Litre	
	DDT 75 S.P.	18.84 Kg	164.34 kg
9.Shadi Pali	DDT 25 EC	126 litre	126 Litre
10.Chhore	BHC	334.2 kg	334.2 kg
DISRICT : SANGHAR			
1. A.C. Sanghar.	BHC 6% Gr	182.36 kg	182.36 kg
2..F.A.Sindhore	BHC 6% Gr	45.18 kg	45.18 kg
3.F.A Khandro	BHC 6% Gr	140 kg	140 kg
4.F.A.Khipro	BHC 12% WP	750 kg	750 kg
5.P.A Khahi	DDT 25% EC	30 Litre	
6.Lahore Shed/ Shahdadpur	DDT 75% WP	54.54 kg	
	BHC 6% Gr	909.09 kg	
	Aldrin	45 Litre	
BHC 5% Dust	9.09 kg	1047.72 kg	
DISTRICT : DADU			

1.District Store	Dieldrin 20	39.09 Litre	39.09 Litre
Dadu-1			
2.District Store	DDT 75 WP		1425 Kg
Dadu-11	BHC 6 G		8860 Kg
	Endrin 5 G	456 kg	10741kg
3. U/C Sial	BHC 5G		30.90 kg
P.Asstt	DDT		969 kg
	BHC 10 Dust	1880 kg	2879.9 kg
4.T/ C PH: Station	BHC 12% Per		209.09 kg
A.O.	DDT 75 WP		110.8 kg
	Endrin Gr 5%	90.80 Kg	410.69kg
5.P.A.Pat.	BHC 12%		53.63 kg
	Endrin EC 20%		52.780Lt
	DDT WP	64.09 Kg	170.5kg
6.A/C Mehar	DDT Powder		9 kg
A.O.Mehar	BHC 5% Dust		289.52 kg
	BHC6% Gr		4612 kg
	BHC 10% Dust		3725 kg
	Endrine 19.5% EC		332.72 kg
7.T/C Radhan	BHC 6% Gr	68.16 kg	9036.4 kg
A.O.			
8.T/C K.N.Shah	BHC Dust 10%	100 kg	100 kg
A.O.1			
9.T/C K.N.Shah	DDT	223.02 kg	223.42 kg
A.O.11	BHC Dust		40 kg

10.U/C Thalho	Dieldrin	1.5 Lt	1.5 Litre
F.A.			
11.T/C Johi	Dieldrin 20% EC		98 Lt
DDT 75% WP		261.1 kg	359.1kg
12.U/C Kamal Khan.F.A-1	DDT 75% WP	35.00 kg	35.00 kg
13.U/C Kamal Khan	Dieldrin 20% EC	2 Lt	2 Lt
F.A.11			
14.U/C Johi A.O.	BHC 12%		16.81 Kg
DDT 75% WP		20.00kg	36.81kg
15.U/C Chhinni	DDT 75% WP	35.454 kg	35.454 kg
A.O.			
16.U/C Drigh Bala	DDT 75% WP		38.9 kg
F.A.	BHC 10%		24.46 kg
BHC 12%		34.9 kg	98.26kg
17.U/C Bahawalpur	DDT 75% WP	28 kg	28 kg
18.9U/C Phulgi Village	DDT 75% WP		22.72 kg
Bahawalpur F.A.11.	Dieldrin 20% EC	190.19 Lt	212.91kg
19.U/C B.Pur	BHC 12%		16.9 Kg
F.A.111	DDT 75%		87.73 kg
	Eldrine 5% Gr	17.53 kg	122.16kg
20.T/C Bhan	Endrine 5% Gr		45.45 kg
A.O.	DDT Powder	284.54 kg	329.99kg

21.U/C Lakha	Heptachlore Gr	10.63 kg	
F.A.	BHC 10% Dust	70.77 kg	
DDT 75%	134.18 kg	215.58kg	
22.U/C Sann	DDT Dust	119.72 kg	119.72 kg
A.D.			
23.Kotri	Endrine 5% Gr	49.496 kg	
	DDT 75% WP	6162.250 kg	
	BHC 6G	29.294 kg	
	BHC 10% Dust	2882 kg	
	DDT 25% EC	31.05 Lt	
	Dieldrin 20% EC	62 Lt	
	Heptachlore 20% Gr	98.992 kg	9315.082 kg
DISTRICT :NAWABSHAH			
NAME	PESTICIDES	QUANTITY IN (MT)	TOTAL
		MILLION TONS	
1.District Store	DDT 25% EC	9.548	
Nawabshah	BHC 5% Gr	0.770	
	Endrin 5% Gr	0.425	
	BHC 10% Dust	0.570	
	DDT 75% WP	0.005	11.318
2.Gul Beg Mari	BHC 10% Dust	0.05	0.05
Taluka Nawabshah			
3. Jam Sahib Taluka	BHC 10%	0.7	
Nawabshah	DDT	0.09	0.79
4. 60 Mile Taluka	Heptachlore Gr	0.16	

Nawabshah	BHC 10% Dust		0.245	
	DDT 75%		.1	.505
5.Bucheri Taluka	Heptachlore		0.045	0.045
Nawabshah				
6.Daur Taluka	BHC 12% WP		0.025	
Nawabshah	Dieldrin 19%		0.013	
	BHC 10% Dust		1.36	1.398
7.Haji Ali Murad	BHC 10%		0.35	
Taluka Nawabshah	DDT		0.036	
	Dieldrin	0158	.4018	
8. Sakrand Taluka	DDT 25% EC		0.081	
Nawabshah	BHC 10% Dust		7.119	
	BHC 12% WP		0.022	
	DDT 0.025		7.247	
9.Moro 1	DDT EC		0.813	0.813
10.Moro 11	DDT 75% WP		0.846	
	Endrine		0.011	
	DDT 25% EC		0.805	
	BHC		0.76	2.422
11Daulatpur Taluka	Endrine 5% G r		0.46	
Moro	BHC 10% Dust		0.07	
	DDT 25% EC		0.01	.54
12. New Jatoi Taluka	Dieldrin		0.459	
Moro	BHC		3.2	3.659

13.New Jatoi	DDT	0.017	0.017
14.New Jatoi 111	Dieldrin	0.201	
Dangraj Taluka	BHC 10% Dust	0.25	.451
N.Feroze			
15.Arban Taluka	BHC 10% Dust	0.25	0.25
N. Feroze			
16.Mithiani Taluka	BHC 10% Dust	0.15	0.15
N.Feroze			
17.Ahjee Taluka	BHC 10%	0.225	0.225
Noshehroferoze			
18.Paddidan,Taluka	BHC 10%	0.409	
N .Feroze	DDT 25% EC	0.215	.624
19.Dow Derbello	Aldrine	0.202	
Taluka N.Feroze	Dieldrine	076	
	BHC 5% Dust	1.13	77.332
20.Bhiria , Taluka	BHC 10%	0.0679	0.0679
N.Feroze			
21.Derbelo, Taluka	BHC	0.29	0.29
Kandiaro			
22.Kandiaro	BHC	0.05	
	BHC 5%	0.15	0.2
23.Bhiria Taluka	BHC 10% Dust	0.985	0.985
N.Feroze			
DISTRICT KHAIRPUR			

1.U.C Bakt Khan	BHC 10% Dust	0.585	0.585
2..U.C Tando Mir Ali	BHC 10% Dust	2.470	2.470
3.U.C Setharja Farm	BHC 10% WP	0.250	0.250
4.U.C Kot Mir	DDT 75% WP	0.325	
Mohammed	BHC 10% Dust	0.400	0.725
5.U.C Hodal Shah	DDT 50%	0.063	
	BHC 10% Dust	0.250	
	DDT 75 WP	0.027	
6.U.C Ahmedpur	BHC 10% Dust	0.150	0.490
7.U.C Sagyoon	Heptachlore 20% Gr	0.850	
	BHC 12%	0.049	.899
8.M.C Gambar	BHC 10% Dust	1.883	1.883
9.U.C Zafarabad	DDT 25% WP	0.4715	
	BHC 10% Dust	0.180	
	Endrine 5%Gr	0.028	
	BHC 10% Dust	0.120	
	BHC 10% Dust	0.050	
10.U.C Kot laloo	BHC 5 Gr	1.650	2.4995
11.U.C Kathoor			
Bunglow	BHC 12% WP	0.00533	
	BHC 5% Gr	0.62272	
	Endrin 2.5 Gr	0.13638	
	Dialdrin 20% EC	0.17996	
	Heptachlore 20% Gr	0.050	
	DDT 75% WP	0.150	

	Endrine 19.5 EC	0.202	
12.Divisional Store	BHC 10% Dust	0.250	1.59639
Khairpur			
13.Kotdiji Farm,U.C	BHC 10% Dust	0.375	
	Heptachlore 20%	0.018	.393
14.District Store	BHC 5% Gr	0.2	0.2
Khairpur			
SCARP KHAIRPUR			
1.Head Quarter	Endrin 5% G	170kg	
Store	BHC 6 Gr	98.0 kg	
	BHC 5 Dust	11.6kg	
	BHC 10 Dust	2050kg	
	BHC 12 WP	250kg	
	DDT 75% EC	112kg	
	BHC 12 WP	101.7kg	
	Heptachlore Gr	49.9kg	2843.2 kg
2.Sub-Sector	DDT 25 EC	19.0 Litre	
Khairpur	Toxaphine 80% EC	2.7 Litre	
	Endrine 5Gr	49.45 kg	
	DDT 50 WP	24 Kg	95.15 kg
3.Sub Sector Mori	DDT 25 EC	9.0Litre	
	BHC 10Dust	137 kg	
4.Sub Sector	BHC 10Dust	54 kg	
Pirgoth	DDT 25 EC	23 Litre	223 kg
5.Sub sector	BHC 10 Dust	135.0 kg	
Ahmedpur	Dieldrin EC	229.43 L	

	DDT 25% EC	98 kg	
	BHC 5 Gr	16 kg	
6.Sub sector	BHC 10 Dust	18 kg	
Kot Dijl	DDT 75	37 Kg	533.43 kg
7.Sub Sector	BHC 10 Dust	335 kg	
Sotharja	DDT 50WP	18-72 kg	
	DDT 75	206.54kg	
	BHC 6Gr	97-72kg	
8.Sub-Sector	DDT 50 WP	88kg	
Tando Masti	DDT 75	22.46 kg	
	Heptachlore Gr	13 kg	781.44 kg
9.Sub-Sector	BHC12	36kg	
Ranipur	BHC 10 Dust	30 kg	66 kg
10.Sub-Sector	Endrin EC	10 L	
Kandhra	BHC 10 Dust	112 kg	122 kg
11.Sub-Sector	BHC 10 Dust	20 kg	20 kg
Long Pakir			
12.Sub-Sector	Endrin EC	284-97 L	
KotdijiTile	BHC 6 Gr	249.03 kg	
Area	DDT 75	45.90 kg	
	BHC 10 Dust	44.72 kg	
	DDT 25	17 Litre	
	Dieldrin EC	119.45 Lt	
	BHC 5Gr	15.5 Lt	776.57 kg
DISTRICT SUKKUR			

1.Rohri	BHC 5% Dust	406 kg	
	Heptachlore 20	1085 kg	
	Dieldrin 2 EC	873 Lt	2364 kg
2.Hingoro	Heptachlore 20 Gr	22.6 kg	
	Dieldrin 20	385.48 Lt	
	DDT 50 WP	46.67 kg	
3.Dadloi	Heptachlore 20 Gr	45 kg	499.75
4.Januji	Heptachlore Gr	25 kg	25 kg
5.Ruk	Dieldrin 20EC	68 Lt	68 Lt
6.Adilpur	DDT 75 WP	48 kg	
	Endrin 5 G	25kg	
	DDT 50 WP	87 kg	160 kg
7.Gotki	Heptachlore 20 Gr		1818.2 kg
	DDT 75 WP		208 kg
	Endrin 5 G		580 kg
	Dieldrin		525 Lt
	DDT 50 WP		39 kg
8.Mirpur Mathelo	Dieldrin EC	347.5 Lt	3517.7 kg
9.Dhangro	DDT 50 WP	175 kg	175 kg
10.Sono Pitafi	Dieldrin 20 EC	711 Lt	711 Lt
11.Uhauro	Dieldrin 20	360 Lt	360 Lt
12.Raharki	Heptachlore 20 Gr	407 kg	
	Dieldrin 20	744 Lt	1151 kg

13.Kamo Shaheed	Dieldrin 20	280 Lt	280 Lt
14.Yaro Lund	Dieldrin EC	50 Lt	50Lt
DISTRICT SHIKARPUR			
1.Garhi Yasin	DDT 75%	43 kg	43kg
2.Madeji	DDT Powder	242 kg	242 kg
3.Sultan Kot	BHC	1525 kg	1525 kg
4.FESC Lodra Farm	Dieldrin	195 Lt	195 Lt
5.Khanpur	Dieldrin	176 Lt	
	Toxaphine	40 Lt	
	BHC 10%	500 kg	
	Dieldrin	84 Lt	
	Heptachlore Gr	175 kg	
	Endrine	41 kg	
	Aldrine	178 Lt	1194 kg
DISTRICT JACOBABAD			
1.District Store Jacobabad	DDT 75% SP	2293.2 kg	
	DDT 50% WP	67.6 kg	
	Aldrine 40% WP	22.7 kg	
	Endrine 5% Gr	16 kg	2399.5 kg
2.Taluka Store	BHC 10% Dust	75 kg	75 kg

Kandhkot			
3.Taluka Store	DDT 75%	150 kg	150 kg
Thul-1			
4.P.A.StoreU/C	BHC 10% Dust	100 kg	100 kg
Tangwani			
5.Taluka Store	BHC 10% Dust	50 kg	50 kg
Kandhkot 11			
6.Agri : Officer	BHC 6% Gr		1827.27 kg
Kashmore Sore	DDT 75% WP		412-27 kg
	Endrine 5% Gr	90-91 kg	2330.45 kg
DISTRICT : LARKANA			
1.Store at Larkana	BHC 6 G		7700.03 kg
	Endrine 5 G		672.12 kg
	BHC 10 Dust		15921.0 kg
	Dieldrine 20 EC		125.0 Lt
	Heptachlor 20 G		5818.18 kg
	DDT 75 WP		3170.09 kg
	Toxaphine 80	130.5 Lt	33536.92 kg
2.Stores at Larkana	DDT 25 EC		184.27 Lt
	Aldrine 40 WP		448.63 kg
	BHC 5 Dust	136.36 kg	769.26 kg
3. Store at Rashid	BHC 10 Dust	2.15 kg	2 15 kg
Waggan			
4.Store at Dhamrah	Heptachlore 20%		6.0 kg
	Heptachlore 20%	32.0 kg	38.0 kg
5.Store @ Taib	Dieldrine 20%		21.0 Lt

Tal: Ratodero	BHC 10 Dust	60.0 kg	81 kg
6.Store @ Wagan	BHC 10% Dust	150.0 kg	
	Endrine 5 G	612.0 kg	762 kg
7.Store @ Lakha	Endrine 5G	329.0 kg	
Taluka Warah	BHC 10 Dust	75.0 kg	404 kg
8.Store @ Warah	Endrine 5 G	1304.0 kg	
	BHC 10 Dust	61.0 kg	
	DDT 75 WP	45.0 kg	
	Heptachlore Gr	251.0 kg	1661 kg
9.Store @ Sajawal	Dieldrine 20 EC	36.0 Lt	36.0 Lt
10.Store @ Bahman	BHC 10 Dust	23.0 kg	23.0 kg
Tal: Ratodero			

**Sindh: District wise quantity of obsolete pesticides and POP pesticides
(Government book entries, 1980)**

S. No	District	Total pesticides	POP pesticides	No of Sites
1	Karach	414.2 MT	15470 Lt & 200000 Kg	05
2	Thatta	107.1 MT	28271 Kg	17
3	Badin	77.394 MT	30000 Kg	13
4	Hyderabad	305.53 MT	115,326 Kg & 13850 MT	05
5	Dadu	404.72 MT	28120.26 Kg	29
6	Nowabshah	125.5 MT	338,568 Kg	38
7	Khairpur	74.84 MT	136,124 Kg	21
8	Khairpur scrap	26.14MT	998.6 Lt & 502.3 Kg	16
9	Sakkar	53.63MT	543,40 Kg and 3996,6 Lt	14
10	Larkana	162.65MT	20000Kg & 500Lt	10
11	Tharparkar/Mirpurkhas	81.19MT	37,82.8 Kg & 126 Lt	14
12	Sanghar	55.62MT	2189.8 Kg & 75 Lt	08
13	Jacobabad	54.36MT	4255.04 Kg	09
14	Shikarpur	72.64MT	2526 Kg & 673 Lt	06

Survey of obsolete pesticide & POPs Pesticide stored in Districts of Sindh

District	No of sites	Site surveyed	Total pesticides	Pop pesticides	Present condition	Other stores
Karachi	05	Provential stores Malir city	410.56MT	20MT & 15425Lt	Storage site an open yard and pestide was not avaiambe at the site	Other sites did not exist any more
Thatta	17	Thatta HQ	11.891MT	1.00MT	Posticed stock was not avaiambe at site	Other sites did not exist
Badin	13	District store Badin	39.17MT	10MT	Store rooms have been converted into offices	No information on the other sites mentioned in Govt record
Hyderabad	05	Divisional store	276.2MT	102.32MT	It was open yard stock has vanished and lot of pesticide residues still present at site, Pesticide may be buried in the premises	Other sites did not exist
		Tando Muhammad Khan			Site did not exist	
		Tando Allah Yar			Site did not exist	
District	No of sites	Site surveyed	Total pesticides	Pop pesticides	Present condition	Other stores
Karachi	05	Provential stores Malir city	410.56MT	20MT & 15425Lt	Storage site an open yard and pesticide was not avaiambe at the site	Other sites did not exist any more

Thatta	17	Thatta HQ	11.891MT	1.00MT	Posticed stock was not available at site	Other sites did not exist
Badin	13	District store Badin	39.17MT	10MT	Store rooms have been converted into offices	No information on the other sites mentioned in Govt record
Hyderabad	05	Divisional store	276.2MT	102.32MT	It was open yard stock has vanished and lot of pesticide residues still present at site, Pesticide may be buried in the premises	Other sites did not exist
		Tando Muhammad Khan			Site did not exist	
		Tando Allah Yar			Site did not exist	

Dadu	29	District store (?)	105MT/33.4MT	2040Lt/11MT	Huge piles of all sorts of pesticides stored within the premises of the AE- office	
		Kotri	220.5MT	3.32MT	Huge pile of pesticide stored close to drinking water supply	
Nawabshah	38	District store Nawabshah	48.13MT	11.32MT	Large quantities of pesticides located within premise of	No information on the other sites

					AE office	
Khairpur	21	HQ store	Not sure about the original quantity of the store pesticides		Largest existing stock of obsolete pesticides in sindh All sorts of pesticides have been shifted to an open area in compliance of high court order	According to the Govt record there were three main storage sites however only one was located and there is no information regarding the other sites
Khairpou r Scrap	16				District reshuffled or relocated	Store has been relocated and no record /information on the stores

Sukkur	14	The store was not identified in the Govt book record	Did not have any information/ record original quantity of the pesticide available in the store		Pesticides residue and scrap material present at site	No information on the other sites
Larkana	10	Divisional store larkana	148.78MT	33281 Kg & 2.50Lt	A large quantity of sorts of pesticides stored in thickly populated area in extremely poor conditions	No information on the other sites
		Store at Bughti farms	Not sure about the stored pesticides		Difficult to match from the listed store	

POPs PESTICIDES

INVENTORIES

N.W.F.P.

NWFP

Pesticides

POPs PESTICIDES IN NWFP

Soon after the starts of POPs project in the mid of March 2004, the data collection regarding POPs availability and its quantification was started in the province. Meetings were arranged with the authorities of Agriculture Department Government of NWFP and Plant Protection Department, as these two are the main stock holders of POPs pesticides in public sector. Field visits were paid and data was collected from different stockholders that were identified by National Project Team.

POPs Pesticides in NWFP are classified as follows:

1. Outdated Stockpiles
2. Market Availability
3. Old Manufacturing Plant

According to the records of Agriculture Officer (Tarnab) only three pops pesticides (Dieldrin, Heptachlor, Endrin) were received by this office during 1980 to 1985 and were distributed as per following details:

Table 2: Pesticides data Turnab Farm, Peshawar

Sr. No.	Pesticides	Quantity (Liters)	Date of Issue	Issued to	Balance	Remarks
1.	Dieldrin	3750	31-7-1981 to 1-6-1983	Different AOs in Peshawar District including Nowshera and Charsadda	Nil	
2.	Heptachlor	950	9-5-1982 to 1-7-1985	Badabir, Turnab, Pabbi and ATI Circles	Nil	
3.	Endrin	1520	27-1-1981 to 2-2-1981	Different AOs in Peshawar District including Nowshera and Charsadda	Nil	



Table 3: POPs Pesticides available in the Market of DIKhan

Sr. No.	Name of Item	DDT (%)	Place of Origin	Purpose of Use	Annual turnover/ Shop	Area of Use
1	Methyl	15	Irani	Multipurpose (cotton, sugarcane etc)	100-150 kg	DIKhan, Bannu
2	Dusting Powder	5-15	Local	For ants control (domestic)	100-150 kg	DIKhan, Bannu
3	785	100	Irani	Multipurpose	Dispatched in bulk	Multan, Lahore, Bannu, Local



Annex-A

Old record of POPs Pesticides with Agriculture Extension Department NWFP

Sr. No	Name of Pesticide	Reporting District Store Location	Date of Purchase / Entry Receipt	Reporting Date	Quantity	Condition of Container	Store Condition	Remarks
1.	Heptachlor-EC ²	Agriculture Officer, Toru - Mardan	1976 ³ 1971	31-5-1988 31-5-1993 12-1995 4-1-1997	5 lit	Rusted	Good	Reported Effective on 31-5-1993 while shown at book balance since 1993 to 1997
2.	Heptachlor-EC	Agriculture Officer, Katlang - Mardan	1976	31-5-1988	4 lit	Rusted	Good	Effective
3.	Heptachlor-WP ⁴	Field Assistant, Dalola ⁵ - Abbottabad	27-5-1971 ⁶ 1-7-1968	31-5-1988 31-5-1993 27-2-1994 26-3-1994 28-12-1995 16-1-1997 4-2-1997 4-7-0997	179.200 kg	Poor Poor		In gunny bags
4.	Dieldrin-EC	Senior Subject Matter Specialist, Agriculture Extension	16-6-1982	31-5-1988	71.5 lit	Poor	Satisfactory	Not analyzed

		Project, Daggar – Buner						
5.	ieldri n-EC	Bilitang, Deputy Director Agriculture, Kohat	1969-70	9-8-1989 31-5-1993 14-4-1994	275.44 lit	Old and rusty		
6.	hlord ane	ATI, Peshawar		9-8-1989	400 lit			In Iron barrels
7.	ieldri n-EC	Junior Subject Matter Specialist, Agriculture Extension Project, Daggar, Buner			71.5 lit			old one
8.	hlord ane	harsadda Distt			37.25 lit			
9.	ldrin 40% EC	ohat			13 gln			
10.	ldrin 40% WP	Kohat			173 lbs			
11.	DT 75% WP	Kohat			96 lbs			
12.	DT 25% EC	Kohat			24 gln			
13.	ieldri n 40% WP	Kohat			422 lbs			
14.	ieldri	Kohat			112 lbs			

	n 20% GR							
15.	ieldri n 20% EC	Kohat			315 gln			
16.	ndrin e 20% EC	Kohat			103 gln			
17.	DT 50% WP	Kohat			560 lbs			
18.	ndrin 5% GR	Kohat			0795 lbs			
19.	eptac hlor 40% WP	Kohat			98 lbs			
20.	ndrin e 19.51 EC	Abbotta bad	2 5-2-1981	31-5-1993	5 lit			
21.	hloro dane WP	Charsad da	2 1-7-1972	31-5-1993	1.25			
22.	ieldri n-EC	Charsad da	1 -2-1972	31-5-1993	1.5			
23.	eptac hlor- EC	Charsad da	2 -4-1979	31-5-1993	19.0			
24.	ieldri n	Deputy Directo r Agricult ure, Malaka nd Divisio n,	982 1	30-4-1993	0 lit			

		Amankot – Swat						
25.	ieldrin 18.69 EC	Buner	1 1-2-1982	31-7-1993	0 lit			
26.	ieldrin 20% EC	ohat		14-4-1994	75.444 lit			Declared as adulterated and under custody of Police Station Bilitang Kohat
27.	ieldrin EC	store Keeper, Shabqadar Office, Charsadda	1 -11-1983		lit			Leaked
28.	eptachlor- EC	Agriculture Officer Sardheri, Field Assistant and Agriculture Officer, Charsadda	1 7-7-1983 2 4-9-1985		9 lit			Leaked at different locations
29.	eptachlor- 32% EC	Charsadda		28-1-1997	19 lit			Leaked
30.	ieldrin EC	Charsadda		28-1-1997	1.5 lit			Leaked
31.	ieldrin 19.5 %EC	Extra Assistant Director, DIKhan		30-6-2000	.6 lit	Explorated		

Samples of POPs Pesticides collected in NWFP

S. No.	Location of sampling	Mode of sampling	No of samples
1	DDT Factory Nowshehra	Water	10
2	-do-	Soil	3
3	-do-	Stock pile	1
4	Tarnab, Peshawar	Water	2
5		Soil	1
6	Nawagai, District Bunir	Water	4
7		Soil	1
8		Stock Pile	1

Total number of soil samples collected = **5**
 Total number of water samples collected = **16**
 Total number of stock pile collected = **2**
 Total number of samples collected = **23**

List of Pesticides Dealers in different districts of NWFP

DISTRICT: BUNIR

CIRCLE: NAWAGAI

No.	Sr.	Name of Dealer	Address
1.		Mr. Fazal Subehan	Nawagai
2.		Mr. Aziz ur Rehman	Nawagai
3.		Mr. Bahram Zeb	Nawagai
4.		Mr. Naseeb Zad Gul	Nawagai
5.		Mr. Shakeel	Kuza, Nawagai

DISTRICT: D.I.KHAN

CIRCLE: D.I.KHAN

No.	Sr.	Name of Dealer	Address
1.		Mr. Mohammad Anwar	Zamindar Zari Adviat, Bannu Road, DIKhan
2.		Mr. Khulbaz	Kidan Zari Adviat, Bannu Road, DIKhan
3.		Mr. Barkatullah	Friend Zari Adviat, Bannu Road, DIKhan
4.		Mr. Qamar Zaman	Madina Zari Adviat, DIKhan
5.		Mr. Mohammad Ikram	Baloch Zari, Adviat, DIKhan
6.		Mr. Niaz Mohammad	Dera Waziristan Zari Adviat Centre, Bannu Road, DIKhan
7.		Mr. Mohammad Ibrahim	United Traders, Bannu Road, DIKhan
8.		Mr. Rehmatullah	Daman Zari Adviat, DIKhan
9.		Mr. Shafqatullah	Zam Zari Service, DIKhan
10.		Mr. Mohammad Younis	Younis Brother Zari Adviat, DIKhan
11.		Mr. Ahmad Hussain	Roshan Agro Zari Adviat, Bannu Road, DIKhan
12.		Mr. Waqar Ali	Green Farming Centre, Bannu Road, DIKhan
13.		Mr. Faqir	Shahdah Zari Centre, DIKhan

No.	Sr.	Name of Dealer	Address
14.		Mr. Javed Admad	Zamindar Zari Service, DIKhan
15.		Mr. Shursheed Ahmad	Zamindar Zari Service, DIKhan
16.		Mr. Khuaja Abdul Majid	Khuaja Zari Service, DIKhan
17.		Mr. Mohammad Ibrahim	Ahmad Zari Adviat & Seed Shop, DIKhan
18.		Mr. Talib Hussain	Aazad Baloch Zari Service, DIKhan
19.		Mr. Mohammad Tariq	Khyber Agri. Traders, Near Cendicate DIKhan
20.		Mr. Khalid	Shameer Trader Parova Adda, DIKhan
21.		Mr. Mohammad Talha Nasir	Nasir Brothers Pesticides Dealer Multan Road, DIKhan
22.		Mr. Mohammad Iqbal	Vil: Miran Jai, Kotjai
23.		Mr. Mohammad Younis	DIKhan
24.		Mr. Nasratullah	Kotjai
25.		Mr. Riaz Mohammad	Ghausta Zari Service, Naiwala
26.		Mr. Gh. Qasim	Aumae Zari Service, Mirani
27.		Mr. Abdul Rashid	Awan Zari Service, Paroa
28.		Mr. Irfan	Gomal Zari Service, Ramak
29.		Mr. Mohammad Iqbal	Kamran Zari Service, Bannu Road, DIKhan
30.		Mr. Ijaz Ahmad	Agro Service Ramak
31.		Mr. Abdul Majeed	Daman Zari Service, Ramak
32.		Mr. Nasrullah	Baloch Zari Service, Parova
33.		Mr. Shah Jehan	Ahad Zari Service, Ramak
34.		Mr. Mohammad Nadeem	Nadeem Baloch Zari Service, DIKhan
35.		Mr. Aftab Momin	Kashtkar Zari Service, Bannu Road, DIKhan
36.		Mr. Mohammad Mushtaq	Chasma Zari Service, Muryali More, DIKhan
37.		Mr. Fahad Adeel	New Daman Zari Service, DIKhan
38.		Mr. Gh. Samadani	Fauji Farming Service, DIKhan

No.	Sr.	Name of Dealer	Address
39.		Mr. Khalid Jan	Lakki Zari Adviat, Bannu Road, DIKhan

DISTRICT: ABBOTTABAD

CIRCLE: ABBOTTABAD

Sr. No.	Name of Dealer	Address
1.	Mr. Shahid Mehmood	Shahid & Co, PMA Link Road, Mandian, Abbottabad
2.	Mr. Sajid Mehmood	Abbottabad Spray Centre, Shireen Market, College Road, Mandian, Abbottabad
3.	Mr. Anwar Khan	Friends Spray Centre, Mandian Chowk, Abbottabad
4.	Mr. Sabir Rehman	Hafiz Zari Service, Lora, Abbottabad
5.	Mr. Gul Khitab	Kissan Zari Service, Havilian, Abbottabad
6.	Mr. Mohammad Ishfaq	Malik Zari Service, Havelian, Abbottabad

DISTRICT: MANSHERA

CIRCLE: MANSHERA

No.	Sr.	Name of Dealer	Address
1.		Mr. Malik Ilyas	Makai Zarai Agency, Bhir Kund
2.		Mr. Mohammad Mushtaq	Mushtaq Zarai Agency, Bhir Kund
3.		Mr. Sabir Sultan	Sabir Sultan Zarai Agency, Bhir Kund
4.		Mr. Khurshid Anwar	Khurshid Anwar Zarai Agency, Bhir Kund
5.		Mr. Mohammad Arshad	Mohammad Arshad Zarai Agency, Bhir Kund
6.		Mr. Israr Ahmad	Phool Zarai Agency, Shinkhari Road, Manshera
7.		Mr. Hamayun Khan	Phool Zarai Agency, Shinkhari Road, Manshera
8.		Mr. Mohammad Zaheer	Zaheer and Co, Shinkhari Road, Manshera
9.		Mr. Fazal Elahi	Zaheer and Co, Shinkhari Road, Manshera
10.		Mr. Mohammad Ajmal	Sarhad Zarai Agency, Shinkhari Road, Manshera
11.		Mr. Imran Qadoos	Imran Qadoos Zarai Agency, Shinkhari Road, Manshera

No.	Sr.	Name of Dealer	Address
12.		Mr. Ejaz Ahmad	Kastkar Zarai Agency, College Road, Manshera
13.		Mr. Akhtar Zaman	Maqbool Zarai Agency, College Road, Manshera
14.		Mr. Mohammad Sajjad	Aziz ul Haq Zarai Agency, College Road, Manshera
15.		Mr. Khalid Aziz	Aziz and Sons Agro Services, College Road, Manshera
16.		Mr. Rashid Iqbal	Kisan Agro Services, College Road, Manshera
17.		Mr. Shoaib Zakeeb	Shoaib Zakeeb City Side Dealer, College Road, Manshera

DISTRICT: MANSHERA

CIRCLE: BAFFA

Sr. No.	Name of Dealer	Address
1.	Mr. Ghulam Sarwar	Pakhal Zari Services, Baffa
2.	Mr. Mohammad Rafique	Insaaf Zari Agency, Baffa
3.	Mr. Mohammad Mumtaz	Pakhal Zari Services, Baffa
4.	Mr. Aurangzeb	Zari Services, Main Bazar, Baffa
5.	Mr. Syed Zafar Ali Shah	Saadat Zari Agency, Baffa
6.	Mr. Roshan Zamir	Suan Zari Store, Baffa
7.	Mr. Mohammad Ilyas	Zari Agency, Baffa
8.	Mr. Zabita Khan	Awami Zari Agency, Baffa
9.	Mr. Mohammad Nazir	Jadoon Zari Agency, Chati Gate, Baffa
10.	Mr. Ali Asghar	Awan Zari Agency, Shinkiari
11.	Mr. Mohammad Saleem	Phool Zari Agency, Shinkiari
12.	Mr. Yar Mohammad Khan	Khan Zari Agency, Baffa
13.	Mr. Mujahid	Muijahid Zari Agency, Baffa
14.	Mr. Aziz ur Rehman	Zari Spary Centre, Baffa
15.	Mr. Shahzada Mohammad	Babar Spray Centre, Baffa

Sr. No.	Name of Dealer	Address
	Saeed	
16.	Mr. Mohammad Wahid	Pesticides Store, Bajwa Bajna Mera, Baffa
17.	Mr. Amir Shahzad	Zari Store, Main Bazar, Bajna, Baffa

DISTRICT: MANSHERA

CIRCLE: OGAI

No.	Sr.	Name of Dealer	Address
1.		Mr. Mohammad Yahya	Darband
2.		Mr. Sain Muhammad	Ogai

**N.W.F.P: Details of local and smuggled POPs pesticides availability in district
DI Khan market**

Sr. No	Name of Item	DDT %	Place of origin	Purpose of use	Annual turnover/shop	Area of use
1	Methyle	15	Irani	Multipurpose (cotton, sugarcane etc)	100-150 Kg	D I Khan, Bannu
2	Dusting powder	5-15	Local	For ant control (domestic)	100-150 Kg	D I Khan, Bannu
3	785	100	Irani	multipurpose	Dispatched in bulk	Multan, Lahore, Bannu, Local

Old record of POPs pesticides with Agriculture Extension Department N.W.F.P.

Sr. No	Name of pesticide	Reporting district store location	Date of purchase/ entry receipt	Reporting date	Quantity	Condition of container	Store condition	Remarks
1	Heptachlor EC ¹	Agriculture officer, Toru- Mardan	1976 ² 1971	31-5-1988 31-5-1993 12-1995 4-1-1997	5 lit	Rusted	Good	Reported effective on 31-5-1993 while shown at book balance since 1993-1997
2	Heptachlor EC	Agriculture officer Katlang-Mardan	1976	31-5-1988	4 lit	Rusted	Good	Effective
3	Heptachlor WP ³	Field assistant Dalola ⁴ - Abbotablad	25-05-1971 ⁵ 1-07-1968	31-5-1988 31-5-1993 27-2-1993 26-3-1994 28-12-1994 28-12-1995 16-1-1997 4-2- 1997 4-7-1997	179.200 Kg	Poor		In Gunny bags
4	Dieldrin EC	Senior subject matter specialist	16-6-1982	31-5-1988	71.5 lit	Poor	Satisfactory	Not analyzed

		agriculture extension project Daggar-Buner						
5	Dieldrin EC	Bilitang deputy director agriculture Kohat	1969-70	9-8-1989 31-5-1993 14-4-1994	275.44 Lit	Old and Rusty		
6	Chlordane	ATI, Peshawar		9-8-1989	400 Lit			In iron barrels
7	Dieldrin EC	Junior subject matter specialist agriculture extension project, Daggar, Buner			71.5 Lit			Old ones
8	Chlordane	Charsadda district			37.25 Lit			
9	Aldrin 40% EC	Kohat			113 Gln			
10	Aldrin 40% WP	Kohat			173 lbs			
11	DDT 75% WP	Kohat			96 lbs			
12	DDT 25% EC	Kohat			24 gln			
13	Dieldrin 40% WP	Kohat			422 lbs			
14	Dieldrin 20% GR	Kohat			112 lbs			
15	Dieldrin 20% EC	Kohat			315 gln			
16	Endrine 20% EC	Kohat			103gln			

17	DDT 50% WP	Kohat			560lbs			
18	Endrin 5% GR	Kohat			3795lbs			
19	Heptachlore 40% WP	Kohat			498lbs			
20	Endrine 19.51 EC	Abbotabad	25-2-1981	31-5-1993	25lit			
21	Chlordane WP	Charsadda	21-7-1972	31-5-1993	21.25			
22	Dieldrin EC	Charsadda	1-2-1972	31-5-1993	11.5			
23	Heptachlore EC	Charsadda	2-4-1979	31-5-1993	119.0			
24	Dieldrin	Deputy direcore agriculture malakand division- Amankot Sawat	1982	30-4-1993	50lit			
25	Dieldrin 18.69 EC	Buner	11-2-1982	31-7-1993	50lit			
26	Dieldrin 20% EC	Kohat	1-11-1983	14-4-1994	275.44 lit			Declared as adulterated and under custody of police station Bilitang Kohat
27	Dieldrin EC	store keeper, Shabkadar office, Charsadda			4 lit			leaked
28	Heptachlore EC	Agriculture officer Sardheri and field	17-7-1983 to 24-9-1985		39 lit			leaked at different locationss

		assistant and agriculture officer Charsadda						
29	Heptachlore EC 32%	Charsadda		28-1-1997	119 lit			Leaked
30	Dieldrin EC	Chahrsadda		28-1-1997	11.5 lit			Leaked
31	Dieldrin 19.5% EC	Extra Assistant Director, DI Khan		30-6-2000	5.6 lit	diplorated		

POPs PESTICIDES

INVENTORIES

BALUCHISTAN

BALUCHISTAN

Pesticides

3.1 Physical Verification of the Plant Protection Department Quetta Stock Pile

Few years back the store was situated in the heart of the city i.e. Zonki Ram Road Quetta, where at present a private college has been established. Later on the pesticide store were shifted near Sariab Railway Station after a huge hue & cry of the precinct population due to its bad odour / smell. At present as mentioned above the store is again situated in an area surround by different public institution and residential colonies i.e. PPD residential Colony, AZRI office & Colony, Fatima Jinnah T.B Sanatorium, Boys and Girls Schools, Institute for Special Children Education etc.

The approximate sizes of store are:

- 1) 25' x 140'
- 2) 25' x 120'

The current status of the stock pile on verification is as under

S.No	Name	Quantity/Unit	Total
1	Dieldrin	175 barrel/ Drums(200 lit/Drum)	35,000 lit
2	Dieldrin(Converted)	22 Drums/barrel	4,400 lit
3	B.H.C (Powder) 12.5%/GAMMA(1960 Stock)	The accurate quantity could not be verified appropriately as the drums were chaotically located and most of the barrels were also damaged/corroded(50 g/container)	

As per Stock register of the PPD

S. No	Name	Quantity	Total
1)	B.H.C	1548 Barrels (50Kg/ Barrel)	77,400 Kg
2)	Dieldrine (asorted)	220 Barrels (200 lit/ Barrel)	44,000 lit
3)	Eldrine	2 Barrels (200 lit/ Barrel)	400 lit
4)	Seven Dust		260 lbs
5)	Kelthane	5 Barrels	
6)	Zolon DT	2 Barrels (200 lit/ Barrel)	400 lit

3.2` Physical Verification of the Provincial Agriculture Department Quetta Stock Pile

The pesticide store of the Provincial Agriculture Department is located within the premises of Agriculture Research Institute with a separate compound covering an area of about two acres of land. In the adjacent area the Vegetable Research Fields are located on about 200 to 300 yards. Moreover, two tub wells and one water reservoir is also functioning in close proximity of the store.

The approximate sizes of store are:

- 1) 25' x 80'
- 2) 40' x 60'

Both the stores are sealed by a committee constituted by the Director General, Provincial Agriculture Department. On inquiry it has been revealed that very few rather nominal quantities of the POPs Pesticides are lying within these stores.

The current status of the stock pile on verification is as under

S.No	Name	Unit	Total
1)	Dieldrin	One Drum (200 lit/Drum)	
2)	Endrin (Converted)	One Drum/barrel	
3)	Heptachlor	3 Drum/ barrel	
4)	Chloridam	One drum	
4)	B.H.C (Powder)	The accurate quantity could not be verified appropriately as the drums were already rusted /corroded and also mixed with a huge pile of about 60 drums or more lying on the ground openly.	

Province/ District:

Balochistan

Store Name and Address: D.M Jamli/ DDO Agriculture (Ext) DM Jamali

Name of Department: Agriculture

Which Stock: Ghulam Muhammad Store Keeper D.M.Jamali

Information in respect of banned pesticides whether expired or not: BHC

S.No	Pesticide Name	Quantity (Kg. Ltr)	Name of Manufacture if given or can be identified	Year of Manufacture or import	Date of expiry as per literature storage with physical condition	Record	Remarks
1.	DDT/ BHC	90 kg	Kakshah kaku	1978	Before 1994 50 kg continue	Nil	Suggest for disposal of BHC

Signature by concerned Agency Representative

DISTRICT WISE STOCK POSITION OF EXPIRED PESTICIDES IN BALUCHISTAN

Prov Store Qta	Qta	Pish	A.du lah	Kill a S.ul ah	rat	Lo raai	Zho b	Koh u	Der a Bugt i	M as tn g	Ka lat	K.da r	L bella	Aw aran	Panj gur	ur bt	aDar	Gh Agai
		2	3	4		6	7	8	9	10	11	12	13	14	15	6	7	18
32000	07	403	NR	842	121	16545	31	364	0	0	57	284	275	NR	10	94	R	1927
50000	42	128	NR	0	374	382	198	415	480	0	44 6	40	764	NR	92		R	8554
82000	49	531	NR	842	495	2025	229	784	480	0	50 3	524	1037	NR	102	94	R	10481

The current status of the stock pile on verification in Balochistan

S. No	Name	Quantity/unit	Total
1	Dieldrin	175 barrel/drums (200lit/drum)	35000 lit
2	Dieldrin (converted)	22 drums/barrel	4,400lit
3	B.H.C (powder) 12.5%/ GAM MA (1960 Stock)	The accurate quantity could not be verified appropriately the drums were chaotically located and most of the barrels were also damaged/corroded (50 kg/container)	

The current status of the stock pile on verification in Balochistan as per stock register of the PPD

S.No	Name	Quantity	Total
1	B.H.C	1548 barrels (50kg/Barrel)	77400kg
2	Dieldrin (assorted)	220 Barrels (200 lit/Barrel)	44000 lit
3	Eldrin	2 Barrels (200 lit/Barrel)	400 lit
4	Seven dust		260 lbs
5	Kelthane	5 Barrels	
6	Zolon DT	2 Barrels (200 lit/ Barrel)	400 lit

POPs PESTICIDES

INVENTORIES

A.J.K.

**List of pesticides to be disposed off provided by Department of Agriculture,
Govt. of AJ&K**

S.No	Location	Name of Pesticides	Packing	Qty
1.	Muzaffarabad central store	Agtoxin (Aluminium Phosphide)	Bottle	237
2.		Tenekil Plus (dichlorovas)	1 lit	108
3.		Methamedophos	1 lit	89
4.		Phostek	250ml	39
5.		Stomp	1lit	35
6.		Cupetox	1kg	3
7.		Dithane m-45	1kg	4
8.		Dithane m-45	1/2kg	19
9.		Dicuran	1kg	2
10.		Chemolin	1kg	25
11.		Boustin	300kg	104
12.		Topic	250gm	6
13.		Elliete	250gm	3
14.		Confidor	100gm	5
15.		Benlate	250gm	15
16.	Distric Bhimber	Match	1lit	10
17.		Cahmion	Packets	3
18.		Topic	Pacjets	7
19.		Polo	1 lit	2
20.		Ridomil	Kg	11
21.		Antracol	1 lit	7
22.		Confidor	1lit	4

23.		Elliet	250 gm	9
24.		Dithane M-45	1 kg	23
25.		Boston Powder	Kg	4
26.		Advantage	205 lit can	2
27.		Foliol		1
30.	District	Dithane M-45	1 kg	28
31.	Muzaffarabad	Lorsbene	1 lit	1
32.	(Pothian Dunna, Athmuqam,	Monchrotophos	1 lit	4
33.	Saidpu, Ghari Dopata, Kel, Kot Tarala extension centres)	Confidor	100gm	500
34.		Diptrex	1 kg	4
35.		Puma super	1 lit	3
36.	District Sudnoti	Nauvacran	1100gm pack	11
37.	(Tarar Khal	Bactril-M	1 lit	11
38.	extension centre)	Actara	250 pack	11
39.		topic	250 gm pack	11
40.	District Bhimber	Foliol	1 lit	4
41.		Topa guard	1 lit	1
42.		Elliete	250 gm pack	1
		Termicide	1 lit	1

POPs PESTICIDES

INVENTORIES

**NORTHERN
AREAS**

Information regarding pesticides in District Skardu and Ghangche, Northern Area

S.No.	Name of pesticides	Amount
1.	Tinakil +	6 carton (40 bottle of ½ lit per carton)
2.	Arrivo	20 bottle of ½ lit
3.	Devavos	50 bottle of 100 ml
4.	Metalex	10 box (500 gm/box)
5.	Carbandizene	10 bottles (250 bottles of 250cc)
6.	Repcard	1 carton (24 bottle of 250 cc)
7.	Karate	3 carton (24 bottle per carton of 250cc)
8.	Thunder	2 carton on (10 bottle each of ½ lit)
9.	Furadan	8 carton on 16 kg per carton
10.	Seven dust	9 carton on 16 kg per carton
11.	Seven powder 85	12 carton on 16 kg per carton

AGRICULTURE EXTENSION

Common Name	Quantity (Kg. or Lit) Specify	Name of manufacturer	Year of manufact ure	Date of expiry / storage with physical condition who has certified to have outlived utility	Weather approved by competent authority for disposal not	Approxim ate purchase value
4-D	1 Drum		1981	Poor		
4-D	1823 tins		1983	Good		262/50 tin
4-D	175.7 Kgs	Al Noor & Company Qta	1993	Good		375/Kg
Mebin	19 drums	Entomology Deptt	1977	Poor		
Nthio 25 EC	122 lits	Sandoz (Pak) Ltd Karachi	1986	Poor		99-110 tin
Ntracol 70 WP	56 Kgs	Chemdyes Pak, Ltd. Karachi	1990	Good		130/kg
TMOTOS	10 lits	-	-	Good		
Tonik EC	75.8 lits	Agricides Ltd. Karachi	1984			308/lit

Zodrin 40 EC	2 lits	Pak Burma Shell Karachi	1981	Poor		94/20 lit
H.C 10%	1 kg	Ithad Polty K Shah Kaku	1992	Good		37/50 kg
Asudin 10 G	50 kg	Ciba Giegy Karachi	1984	Poor		19 / kg
Asudin 60 EC	65 lits	Ciba Giegy Karachi	1986	Good		146/kg
Ayfolan EC	1288 lits	Faizan impex Ltd. Karachi	1990	Good		185/lit
Aygon Dust	4954 kgs	Faizan impex Ltd. Karachi	1990	Good		
Ayleton EC	32 lits	Shan impex Karachi	1990	Poor		310/lit
Aysikal KN	50 bags	-	1988	Good		12/kg
Aythroide	1191 units	Faizan impex Ltd. Karachi	1989	Good		31/ unit
Enlate 50 WP	113 kg	-	1977	Poor		110/ kg
Uctril M 40 EC	29 lit	-	1994	Good		380 / lit

AGRICULTURE EXTENSION

Common Name	Quantity (Kg. or Lit) Specify	Name of manufacturer	Year of manufacture	Date of expiry / storage with physical condition who has certified to have outlived utility	Weather approved by competent authority for disposal not	Approximate purchase value
4-D	1 Drum		1981	Poor		
4-D	1823 tins		1983	Good		262/50 tin
4-D	175.7 Kgs	Al Noor & Company Qta	1993	Good		375/Kg
Mebin	19 drums	Entomology Deptt	1977	Poor		
Nthio 25 EC	122 lits	Sandoz (Pak) Ltd Karachi	1986	Poor		99-110 tin
Ntracol 70 WP	56 Kgs	Chemdyes Pak, Ltd. Karachi	1990	Good		130/kg
TMOTOS	10 lits	-	-	Good		
Tonik EC	75.8 lits	Agricides Ltd. Karachi	1984			308/lit
Zodrin 40	2 lits	Pak Burma Shell Karachi	1981	Poor		94/20 lit

EC						
H.C 10%	1 kg	Ithad Polty K Shah Kaku	1992	Good		37/50 kg
Asudin 10 G	50 kg	Ciba Giegy Karachi	1984	Poor		19 / kg
Asudin 60 EC	65 lits	Ciba Giegy Karachi	1986	Good		146/kg
Ayfolan EC	1288 lits	Faizan impex Ltd. Karachi	1990	Good		185/lit
Aygon Dust	4954 kgs	Faizan impex Ltd. Karachi	1990	Good		
Ayleton EC	32 lits	Shan impex Karachi	1990	Poor		310/lit
Aysikal KN	50 bags	-	1988	Good		12/kg
Aythroide	1191 units	Faizan impex Ltd. Karachi	1989	Good		31/ unit
Enlate 50 WP	113 kg	-	1977	Poor		110/ kg
Uctril M 40	29 lit	-	1994	Good		380 / lit

EC						
Buctril M 40 EC	48 lit	Rhone Poulenc HYD	1999	Good		675 / lit
Celethion 50 EC	1 lit	Atul Pak. Ltd Karachi	1984	Poor		211 / lit
Cobox WP	10kg	Agricides ltd Karachi	1983	Good		55 / kg
Cupravit	49 kg	Disst. Controller stores Karachi	1982	Poor		
Cycocel	3 Drums	Entomology Deptt.	1977	Poor		
Cymbush EC	109 lit	Agricides ltd. Karachi	1984	Good		560 / lit
Dacamox 5.G	154 kgs	Agricides ltd. Karachi	1996	Good		57 / kg
Daltanet 100 EC	549 / 800 ml	Ciba Giegy Karachi	1988	Good		876 / lit
Danitol 10 EC	81 lits	Agricultural Cehm Karachi	1977	Poor		425 lit

Detia Gas	1 tin		1982	Poor		-
Dimecron 100	52 lits	Ciba Giegy Karachi	1985	Poor		200
Diptrex 80 SP	97 Drums	Bapco ltd Karachi	1977	Poor		122 / kg
Diptrex 80 SP	740 kgs		1983	Poor		-
Dithane M 45	846 kgs	Distt. Controller Stores Karachi	1977	Poor		56/kg
Dowfume 75	6 Drums	Entomology Deptt.	1984	Good		-
Dowpan M	3609 kgs	Agricides ltd Karachi	1999	Good		103 / kg
Ecdidine EC	220 lits	Agricides ltd Karachi	1986	Good		620 lits
Ekalux 25 EC	92 lits	Sandoz pak Karachi	1989	Poor		150 lit

Ekalux 5 G	192 lits	Sandoz pak Karachi	1989	Poor		30 / kg
Ethion 46.5 EC	65 lits	Atul Pak ltd Karachi	1989	Poor		160 / lit
Ferus Sulphate	700 kg	Fico chemicals industries	1995	Good		23 / kg
Folidol M- 50	2 Drums	Entomology Deptt.	1977			-
Folidol M- 50	6 lits	Distt. Controller stores Karachi	1984	Poor		70 / lit
Furadon 3G	10 kg	Hassan Zarai Markaz Qta	1995	Poor		59 / kg
Furadon 3G	276 Bags	Agolet international LHR	1999	Good		68 / kg
Fyfnon 57 EC	315 lits	Hassan Zarai Markaz Qta	1995	Good		376 / lit
Fyfnon 57 EC	143 lits		1996	Good		330 / lit

Fyfnon 57 EC	193.5 lits	Mahmood Zarai Carp. Qta	1997	Good		497 / lit
Gibbrallic Acid	4.382 kgs	Agricides ltd. Karachi	1986	Good		300 / lit
Gusathion M20	2 lits	Balochistan Zarai Markaz Qta	1991	Poor		225 / lit
Gusathion M20	556 lits	Bapco Pvt. Karachi	1988	Poor		155 / lit
Herinol EC	350 lits	Fizan impex ltd. Karachi	1994	Good		195 / lit
Iron Chellate	88 kg	Hoffmann & Ross Karachi	1991	Good		510 / lit
Larsban 40 EC	2 lit	Hassan Zarai Markaz Qta	1995	Good		497 / lit
Larsban 40 EC	105 lits	D. E United	1999	Good		246 / lit
Larsban 40	156.6	Hassan Zarai Markaz Qta	1984	Good		256 / lit

EC	lits					
Larsban ULV	1014 lits	Agricides ltd. Karachi	1984	Good		210 / lit
Luesagon	18 lits	National Insecticides Karachi	1992	Poor		245 / lit
Mafu	691 lits	Chemdyes Pak Karachi	1989	Good		178 / lit
Malathion 57 EC	140 lits	Alintco ltd. Karachi	1991	Poor		170 / lit
Malathion Ematos	10 lits	Alintco ltd. Karachi	1988	Poor		128 / lit
Metasystox R 25	195 lits	Distt. Controller stores Karachi	1983	Poor		76 / kg
Methamedo phos 60 SL	947 lits	Hassan Zarai Markaz Qta	1995	Good		369 / lit
Methamedo phos 60 SL	19 lits	Mahmood Zarai Carp. Qta	1997	Good		300 / lit
Methamedo	35	Agrolet international	1999	Good		350 / lit

phos 60 SL	b/900 ml	LHR				
Methyl parathlon	355 lits	Syed ltd Karachi	1985	Poor		85 / lit
Miro 50 EC	175 lits	Boots Co. Pak Karachi	1981	Good		-
Monitor 600	26 lits	Avaari & Co. Karachi	1986	Poor		200 / lit
Morocide 40 EC	310 lits		1977	Poor		-
Nemagon EC	13 drums	Entomology Deptt.	1977	Poor		-
Neoron 500 EC	1 lit	Cib Giegy Karachi	1990	Poor		40 / 30 / lit
Nogos 100 EC	18 lits	Cib Giegy Karachi	1983	Poor		140 / lit
Orthene 75 SP	63 kgs	Avaari & Co. Karachi	1981	Poor		-
Ostico	2		1979	Poor		-

	drums					
Fyfnon 57 EC	193.5 lits	Mahmood Zarai Carp. Qta	1997	Good		497 / lit
Gibbrallic Acid	4.382 kgs	Agricides ltd. Karachi	1986	Good		300 / lit
Gusathion M20	2 lits	Balochistan Zarai Markaz Qta	1991	Poor		225 / lit
Gusathion M20	556 lits	Bapco Pvt. Karachi	1988	Poor		155 / lit
Herinol EC	350 lits	Fizan impex ltd. Karachi	1994	Good		195 / lit
Iron Chellate	88 kg	Hoffmann & Ross Karachi	1991	Good		510 / lit
Larsban 40 EC	2 lit	Hassan Zarai Markaz Qta	1995	Good		497 / lit
Larsban 40 EC	105 lits	D. E United	1999	Good		246 / lit

Larsban 40 EC	156.6 lits	Hassan Zarai Markaz Qta	1984	Good		256 / lit
Larsban ULV	1014 lits	Agricides ltd. Karachi	1984	Good		210 / lit
Luesagon	18 lits	National Insecticides Karachi	1992	Poor		245 / lit
Mafu	691 lits	Chemdyes Pak Karachi	1989	Good		178 / lit
Malathion 57 EC	140 lits	Alintco ltd. Karachi	1991	Poor		170 / lit
Malathion Ematos	10 lits	Alintco ltd. Karachi	1988	Poor		128 / lit
Metasystox R 25	195 lits	Distt. Controller stores Karachi	1983	Poor		76 / kg
Methamedo phos 60 SL	947 lits	Hassan Zarai Markaz Qta	1995	Good		369 / lit
Methamedo	19 lits	Mahmood Zarai Carp.	1997	Good		300 / lit

phos 60 SL		Qta				
Methamedo phos 60 SL	35 b/900 ml	Agrolet international LHR	1999	Good		350 / lit
Methyl parathlon	355 lits	Syed ltd Karachi	1985	Poor		85 / lit
Miro 50 EC	175 lits	Boots Co. Pak Karachi	1981	Good		-
Monitor 600	26 lits	Avaari & Co. Karachi	1986	Poor		200 / lit
Morocide 40 EC	310 lits		1977	Poor		-
Nemagon EC	13 drums	Entomology Deptt.	1977	Poor		-
Neoron 500 EC	1 lit	Cib Giegy Karachi	1990	Poor		40 / 30 / lit
Nogos 100 EC	18 lits	Cib Giegy Karachi	1983	Poor		140 / lit
Orthene 75	63 kgs	Avaari & Co. Karachi	1981	Poor		-

SP						
Ostico	2 drums		1979	Poor		-
Padan 4 G	2 kgs	Hassan zarai Markaz Qta	1995	Good		59 / kg
Padan 4 G	153 kgs	Mahmood Zarai Carp. Qta	1997	Good		67 / 50 / kg
Paramit	7 lits	National Insecticides Karachi	1992	Poor		260 / lit
Parzete	4 drums	Entomology Deptt.	1977	Poor		-
Perfecthiom 40 EC	50 lits	Agricides ltd. Karachi	1988	Poor		133 / lit
Perfecthiom 40 EC	112 lits	Agricides ltd. Karachi	1983	Poor		107 / 138 / lit
Rhostoxim RTAB	10 tins	AG Services & Supl Karachi	1982	Poor		-

Plictron 50 WP	1613 kgs	Agricides ltd. Karachi	1983	Good		660 / kg
Polyram Combi	283 kgs	Agricides ltd. Karachi	1989	Good		66 / kg
Polythin C	12 lits	Novartis Karachi	1999	Good		750 / lit
Polyrm fort	18 Drums	Entomology Deptt.	1977	Poor		-
Raccumin Bait	647 kgs	Chemdyes Pak Karachi	1989	Good		40 / kg
Rogor L 40	76 lits	Alintco ltd Karachi	1987	Poor		150 / lit
Ronstar 12 EC	33 ml	Mahmood Zarai Carp. Qta	1997	Good		370 / lit
Sailan 35 EC	40 lits	Agricides ltd Karachi	1986	Poor		124 / lit
Sailo EC	459 lits	Faizan impex pvt. Karachi	1994	Good		210 / lit

Salfec WP	2.74 kgs	Faizan imped pvt. Karachi	1989	Good		100 / grms
Sandofat	3.5 lits	Sandoz pak Karachi	1986	Poor		47 / lits
Saprol 19 EC	1 Drum	Distt. Controller stores Karachi	1982	Poor		118 / lit
Saprol 19 EC	55 lits	Distt. Controller stores Karachi	1982	Poor		-
Semsan Bell	1 Drum	Entomology Deptt.	1977	Poor		-
Seven Dust 10%	30 kgs	Hassan Zarai Markaz. Qta	1995	Good		82 / kg
Seven Dust 10%	2 Bags	Mahmood Zarai Carp. Qta	1997	Good		84 / kg
Seven Dust 10%	185 kgs	National Insecticides Karachi	1992	Poor		14 / 84 / 50 / kg
Starm F-34 EC	3 Drums	Entomology Deptt.	1997	Poor		-

Stomp 330 EC	1.5 lits	National Insecticides Karachi	1992	Good		320 / lit
Sumiciden Super	495 lits	Al Noor & Co. Qta	1994	Good		650 / lit
Supracide 40 EC	43 lits	Cib Giegy Karachi	1981	Poor		194 / 50 / lit
Sweep 250 EC	66 lits	Agrolet International LHR	1999	Good		850 / lits
Tedion V 18	25 lits	Distt. Controller stores Karachi	1980	Poor		-
Tedion V 18	77 lits	Syed ltd. Karachi	1984	Good		105 / lit
Thio dan 5 G	10 kgs	Hoechest Pharmaceutical Pak. Ltd Karachi	1980	Poor		-
Thur icide HP	809 kgs	Distt. Controller stores Karachi	1982	Good		188 / kg
Top	48 kgs	Hassan Zarai Markaz.	1995	Good		621 / kg

sin M		Qta				
Tropotox EC	8 Drums	Entomology Deptt.	1977	Poor		-
Vitavax 200	84.5 kgs	-	1993	Good		425 / kg
Vitavax 200	64 kgs	Distt. Controller stores Karachi	1984	Good		425 / kg
Weed PN	1 Drum	Entomology Deptt.	1977	Poor		-
Winter Oil	75 lits	Pak. Barma Shell Karachi	1980	Good		-
Zinc Su;phate	2800 kgs	Fico Chemical Industries	1995	Good		25 / kg
Ziram	4 Drums	Entomology Deptt.	1977	Poor		
Zolon 35 EC	125 lits	Mahmood Zarai Carp. Qta	1997	Good		470 / lit

PUNJAB

PCBs

1 USES of PCBs

PCBs were used in a very wide variety of applications in both industrial and consumer products. The WHO categorized the as completely closed, nominally closed and open-ended (IPCS, 1992). The uses can be summarized as:

1. Completely Closed Systems

- a. **Electrical transformers**
- b. **Electrical capacitors (including lamp ballasts)**
- c. **Electrical switches, relays and other**
- d. **Electrical cables**

2. Nominally Closed Systems

- a. **Hydraulic systems**
- b. **Heat transfer systems (heaters, heat exchangers)**

3. Open-ended systems

- a. **Plasticizer in PVC, neoprene and other artificial rubbers**
- b. **Ingredients in paint and coatings**
- c. **Ingredients in ink and carbonless copy paper**
- d. **Ingredients in adhesives**
- e. **Pesticide extender**
- f. **Ingredient in lubricants and sealants**
- g. **Fire retardants in fabrics, carpets, etc**

12 SURVEY

1. **Name of the company:** TR workshop Pakistan WAPDA Foundation LHR

2. **Year of Formation under Foundation:** 2001

3. **Year of Establishment of Transformers Repair Workshop:** 1977
4. **Mailing Address of the Workshop:** TR workshop Pakistan WAPDA Foundation Sultan Mehmood Rd. LHR.
5. **Name of the oil used in Transformer:** “Naphthanic oil” originated from the processing of Base oil
6. **Acceptance tests of New transformer oil:**
- Specific gravity at 20⁰C = 0.895g/cm³ (Max)
 - Viscosity at 20⁰C = 40cs (Max)
 - Acidity neutralization value = 0.03mg KOH/g of oil (Max)
 - Flash point = 140⁰C (Min)
 - Pour point = -30⁰C
 - Moisture content = 30PPM (Max)
 - Dielectric strength = 30KV (Min)
 - Tangué Delta = 0.005 (Max)
 - Corrosive Sulphur = Non corrosive
 - Oxidatiuon stability = Acidity after oxidation 0.4, Sludge 0.10% (Max)
7. **Does workshop have Dehydration facilities?** Yes

“DATA COLLECTED”

**Table 1: ANNUAL PRODUCTION IN Nos. & KVA
TRANSFORMER WORKSHOP SHALAMAR LHR**

Sr. No.	YEARS	Nos.	KVA
1	1990-91	2435	158265
2	1991-92	3520	259545
3	1992-93	3468	283215
4	1993-94	2653	220855

5	1994-95	1227	107720
6	1995-96	2935	247825
7	1996-97	2761	212560
8	1997-98	3047	261126
9	1998-99	2281	191195
10	1999-00	2839	312405
11	2000-01	3770	379470
12	2001-02	3853	364335
13	2002-03	5634	473450
14	2003-04	4815	442295
15	2004-05	2494	314495
TOTAL		47732	4228756

Table 2: MONTHLY PROGRESS FOR 2000-2001 IN Nos.

TRANSFORMER WORKSHOP SHALAMAR LHR

MONTHS	25 KVA	50 KVA	100 KVA	200 KVA	MISC	TOTAL
July	31	32	159	88	1	311
August	34	97	146	75	2	354
September	93	46	69	106	3	317
October	80	89	97	48	4	318
November	43	70	121	72	3	309
December	47	136	70	47	-	300
January	40	58	113	88	2	301
Feburary	32	121	130	19	2	304
March	40	87	114	63	1	305
April	68	69	85	36	2	260

May	25	133	96	88	3	345
June	79	11	84	165	7	346
TOTAL	612	949	1284	895	30	3770

Table 3: MONTHLY PROGRESS FOR 2001-2002 IN Nos.

TRANSFORMER WORKSHOP SHALAMAR LHR

MONTHS	25 KVA	50 KVA	100 KVA	200 KVA	MISC	TOTAL
July	2	93	155	71	6	327
August	1	121	13	127	1	263
September	0	86	176	71	0	333
October	68	115	108	9	6	306
November	21	109	115	59	1	305
December	50	157	72	28	4	311
January	1	112	155	36	6	310
Feburary	93	71	74	100	3	341
March	95	90	82	60	8	335
April	88	178	25	23	6	320
May	11	104	146	68	16	345
June	42	110	101	100	4	357
TOTAL	472	1346	1222	752	61	3853

Table 4: MONTHLY PROGRESS FOR 2002-2003 IN Nos.

TRANSFORMER WORKSHOP SHALAMAR LHR

MONTHS	25 KVA	50 KVA	100 KVA	200 KVA	MISC	TOTAL
July	143	53	53	82	14	345
August	41	20	158	129	2	350
September	65	214	162	51	3	495
October	72	170	166	84	5	497
November	103	310	39	38	8	498
December	114	231	93	47	5	490
January	127	234	68	54	17	500
February	125	176	99	50	8	458
March	63	123	171	133	10	500
April	126	167	112	85	10	500
May	98	202	140	60	0	500
June	58	161	161	118	3	501
TOTAL	1135	2061	1422	931	85	5634

Table 5: MONTHLY PROGRESS FOR 2003-2004 IN Nos.

TRANSFORMER WORKSHOP SHALAMAR LHR

MONTHS	25 KVA	50 KVA	100 KVA	200 KVA	MISC	TOTAL
July	62	163	180	92	5	502
August	59	125	190	121	7	502
September	83	172	134	112	2	503
October	91	244	93	67	8	503
November	100	142	121	73	29	465
December	105	153	59	52	91	460
January	46	97	95	57	31	326
Feburary	55	125	111	34	5	330
March	41	93	110	72	10	326
April	43	97	86	81	7	314
May	34	82	69	88	9	282
June	25	112	66	97	2	302
TOTAL	744	1605	1314	946	206	4815

Table 6: MONTHLY PROGRESS FOR 2004-2005 IN Nos.

TRANSFORMER WORK SHOP SHALAMAR LHR

MONTH S	25 KVA	50 KVA	100 KVA	200 KVA	MISC	TOTAL
July	24	117	86	99	5	331
August	26	22	68	93	9	218
September	22	72	135	124	5	358
October	8	29	41	62	2	142
November	9	51	47	58	15	180
December	34	25	42	52	9	162
January	9	48	39	27	3	126
February	3	27	19	2	6	57
March	16	33	77	103	3	232
April	15	60	64	87	11	237
May	3	25	31	36	7	102
June	36	135	85	85	8	349
TOTAL	205	644	734	828	83	2494

Oil Capacity of Different Power Transformers

Sr. No.	Type of Transformer	Quantity of Oil Used in Liters	Quantity of Oil Used in Kg*
1	25 KVA	80	64
2	50 KVA	121	96.8
3	100 KVA	180	144
4	100/33 KVA	410	328
5	200 KVA	300	240
6	200/33 KVA	480	384

* 1 liter of transformer oil is equal to 0.8 Kg.

SINDH

PCBs

Oil Capacity of Different Distribution Transformers

S.No.	Type of Transformer	Quantity of Oil Used in Liters	Quantity of Oil Used in Tones
1	25 KVA	80	0.064
2	50 KVA	121	0.0968
3	100 KVA	180	0.144
4	100/33 KVA	410	0.328
5	200 KVA	300	0.24
6	200/3 KVA	480	0.384

Oil Capacity of Power Transformers

S.No.	Type of Transformer	Quantity of Oil Used in Tones
1	40 MVA	28
2	20/26 MVA	18
3	20/26 MVA	15
4	20/26 MVA	17.9
5	10/13 MVA	16.5

PCB analysis in Oil

STATION: 1

S.No.	Samples	PCB
1	Centrifuge Oil tank No. I	> 50 ppm
2	Centrifuge Oil tank No. II	> 50 ppm
3	Container No. I	> 50 ppm
4	Container No. II	> 50 ppm
5	Branded Oil	< 50 ppm

STATION: 2

S.No.	Samples	PCB
1	Centrifuge Oil tank No. I	> 50 ppm

2	Centrifuge Oil tank No. II	> 50 ppm
3	Centrifuge Oil tank No. III	> 50 ppm
4	Branded Oil	< 50 ppm
5	Transformers No. I	< 50 ppm
6	Transformers No. II	> 50 ppm
7	Transformers No. III	> 50 ppm
8	Transformers No. IV	> 50 ppm
9	Transformers No. V	> 50 ppm
10	Transformers No. VI	> 50 ppm

STATION: 3

S.No.	Samples	PCB
1	Oil Container No. I	< 50 ppm
2	Oil Container No. II	< 50 ppm
3	Oil Container No. III	< 50 ppm
4	Oil Container No. IV	< 50 ppm
5	Oil Container No. V	< 50 ppm

PCB analysis in Soil

STATION: 1

S.No.	Samples	PCB
1	Sample No. 1	> 50 ppm
2	Sample No. 2	< 50 ppm
3	Sample No. 3	< 50 ppm

STATION: 2

S.No.	Samples	PCB
1	Sample No. 1	< 50 ppm

2	Sample No. 2	< 50 ppm
3	Sample No. 3	> 50 ppm
4	Sample No. 4	< 50 ppm
5	Sample No. 5	> 50 ppm
6	Sample No. 6	> 50 ppm
7	Sample No. 7	> 50 ppm

STATION: 3

S.No.	Samples	PCB
1	Sample No. 1	< 50 ppm
2	Sample No. 2	< 50 ppm
3	Sample No. 3	> 50 ppm
4	Sample No. 4	> 50 ppm
5	Sample No. 5	> 50 ppm

STATION: 4

S.No.	Samples	PCB
1	Sample No. 1	< 50 ppm
2	Sample No. 2	> 50 ppm
3	Sample No. 3	> 50 ppm
4	Sample No. 4	> 50 ppm
5	Sample No. 5	> 50 ppm

STATION: 5

S.No.	Samples	PCB
1	Sample No. 1	< 50 ppm
2	Sample No. 2	> 50 ppm
3	Sample No. 3	> 50 ppm
4	Sample No. 4	> 50 ppm
5	Sample No. 5	> 50 ppm

RESULT:

The PBC test Kits were used for analysis of oil and soil. From Station I five oil samples were collected, one sample shows negative result while four sample results were positive. The soil samples were collected from three places and the result of one sample was positive and two were negative.

TARGETED INDUSTRIES FOR PCBs

LIST OF THE COMPANIES IN POWER SECTORS

1. Karachi Electric Supply Corporation
Bin Qasim Karachi.

- 2 Gul Ahmed Energy Limited.
Plot No.434,Sector 10,
Korangi Industrial Area Karachi

3. Tapal Energy Ltd
Deh Yond Hub River Road
Karachi.

4. Jamshoro Thermal Power Plant
Jamshoro,Sind District Dadu.

5. Guddo Thermal Power Station
District Gotki.

LIST OF PAPER AND PULP INDUSTRIES

KARACHI

1. G.M.Sons (Pvt) Ltd.

F-74-D S.I.T.E, Karachi.

2. Pakistan International Packages.

Plot No.31-G Street No 15 K.I.A, Karachi.

HYDERABAD

1. M/S. Dawn Paper & Board P/13 S.I.T.E, Hyderabad.

2. M/S. Farooq Packages T-48 S.I.T.E, Hyderabad.

3. M/S. Prime Paper Board Mills S.I.T.E, Hyderabad.

4. M/S. Prime Packages C/20 S.I.T.E, Hyderabad.

DADU.

1. Star Paper Mills S.I.T.E Kotri.

THATTA.

1. M/S. Classic Paper Mills Ltd.

Sakroo Road, Gharo, Thatta.

LIST OF THE CHEMICAL AND PAINT INDUSTRIES

1. Pak Chemical Ltd
D-7 S.I.T.E, Manghopir Road
Karachi
2. Punjab Chemical Co.
Jamila Street Karachi.
3. Roomi Chemical Industries
Plot 65 112 sector 24 K.I.A.
Karachi.
4. R.F Corporation Ltd.
D-21 S.I.T.E. Karachi
5. Textile Chemical Industries
E-45 S.I.T.E., Karachi.
6. Farooch Chemical Industries
Osmanabad, Karachi.
7. Industrial Chemical Ltd.
D-29 S.I.T.E , Karachi.
8. Ligo Industrial Ltd.
Hub River Road S.I.T.E.
Karachi.
9. Metalox Industries Ltd.
S-29 S.I.T.E., Karachi.

10. B.A.S.F.(Pakistan) Ltd
Lx-10 11 Landhi area ,Karachi.
11. Allied Chemical Industry
F-99.S.I.T.E, Karachi.
12. Fateh Ali Chemicals
B/86, S.I.T.E, Karachi.
13. Hoechst (Pak) Ltd.
Plot No.23, S-22
Korangi Industrial Area
Karachi.
14. ICI Pakistan Ltd.
Bin Qasim,Karachi
15. Industrial Chemical Ltd.
D/29,S.I.T.E, Karachi.
16. Textile Chemicals Ind.
E-45, S.I.T.E.,Karachi
17. Valika Chemical
Valika Nagar,Off Manghopir Rd
Karachi.
18. Rock Sulphur Refinery Ltd.
S.I.T.E, Karachi.
19. Pak Central Chemical Ind.Ltd
D-21, S.I.T.E, Manghopir Road

Karachi.

20. Pakistan Chemical Corp.

Behind Qamar House
Eduljee Dinshaw Compound
Karachi.

21. Pakistan Chemicals Sodium

Silicate Industries
D/160, Opposite Modern Weighbridge
Shershah Colony
Karachi.

22. Zulfiqar Industries Ltd.

D-19, S.I.T.E, Maghopir Road
Karachi.

23. Reckitt and Colman of Pakistan Ltd.

11 Floor, State Life Bldg.No.11
Abdullah Haroon Road
Karachi.

24. Agro Chemical Ltd

B.33 S.I.T.E Karachi

25. Standard Finis Oil Co

D-33-A S.I.T.E, Karachi.

26. Tyfon Ltd

Old Haji Company Jamila Street, Karachi

27. R.B. Avari and Co Ltd
Fretan Square Opp Wazir Mansim
Railway Station Mauripur Road Karachi.

28. Universal-Chemical Industries,
B-45 S.I.T.E.Karachi

29. Agricide (Pvt) Ltd.
Plot No48 Sector 27 K.I.A. Karachi

30 Hoechst(Pakistan) Ltd
Plot 23 Sector 22 K.I.A Karachi

31. Union Chemical Industries (Pvt) Ltd
Plot No.475 National Highway Landhi
Karachi.

SUKKUR.

1. M/S. Crescent Chemical S.I.T.E., Sukkur.

GOTKI

1. Pak Saudi Fertilizer Mirpur Mathelo
District Ghotki

2. Engro Chemical Pakistan Pvt Ltd
Daharki District Ghotki.

. Buxlay Paint Works
E-20 S.I.T.E, Karachi.

2. Buxlay Paint Works
X-3 S.I.T.E. Karachi
3. Berger Paint (Pak) Ltd
D-31 S.I.T.E, Karachi
4. Imperial Paint and Varnish Works
D-207-A S.I.T.E.,Karachi
5. Ismail-Sons Paints Industries
F-59 S.I.T.E, Karachi
6. Kausar Paint Industries
F-279 S.I.T.E Karachi
7. Modern Paint Industries
F12 S.I.T.E, Karachi.
8. Standard Paint Industries
F-104 S.I.T.E Karachi
9. Unico Paints(Pak)Ltd
Plot 111 Sector 27 K.I.A,Karachi

LIST OF ELECTRICAL APPLIANCES INDUSTRIES

1. Asia Gas Appliances
3/8 Drigh Colony.
2. A.C.T. Industries Ltd.
D-81 S.I.T.E., Karachi
3. Eagle Engineering Works
3/ 16 Shah 15 K.I.A. Karachi.
4. Habibullah Industries (Pvt) Ltd.
Plot 18 Sector 15 K.I.A, Karachi
5. I.Z.O. Appliances (Pvt) Ltd.
Plot 19 sector 27 K.I.A, Karachi.
6. Ideal Industries Ltd.
L.I.C. Block 21 F.B. Area Karachi.
7. Indus Battery Industries Ltd.
F-244 S.I.T.E., Karachi.
8. K.E.S.C.
Aaim al House Abdullah
Haroon Road Karachi.
9. Kohinoor Battery Mfg Ltd
F-70 A S.I.T.E., Karachi.
10. Muhammed Ibrahim and Co Ltd.

S-3 S.I.T.E, Karachi.

11. Metalax Corporation Ltd.

D-120 S.I.T.E, Karachi.

12. Mercantile Industries Ltd.

B 18 S.I.T.E. Karachi.

13. Mehran Electron Co.

18 Sector 8 AN. Karachi.

14. Neon Sign Pakistan (Pvt) Ltd.

Ghafoor Chamber Victora Road
Karachi.

15. National Industries Ltd.

Plot No 177 Sector 23 K.I.A, Karachi.

16. Omega Industries

B- 33 S.I.T.E, Karachi.

17. Philips Electrical Industries Ltd.

18. Pacific Traders (Pak) Ltd.

L-18 Block 21 F.B.Area Karachi.

19.Pak Premier Industries

L-41 Block 21 F.B.Area Karachi.

20. Premier Battery Industries Ltd.

F-488 S.I.T.E, Karachi.

21. Pakistan Air Condition and Refrigeration

- Corporation Ltd.
S-34 S.I.T.E, Karachi.
22. Shahangai Industries (Pvt) Ltd.
F-32 S.I.T.E, Karachi.
23. Slemers Pakistan Co Ltd.
B-/2 S.I.T.E, Karachi.
24. S.N.H Industries
L 19/16/21 F.B.Area Karachi.
25. Shadman Electronic Industries
Plot 201 Sector 23 K.I.A, Karachi.
26. Unique Neon Sign
Raghoo Street Ramswami
Karachi.
27. Jawed Metal Industries
I D 8 ST 9 secotr 16 BN. Karachi.
28. Pakistan Cables Ltd.
B-21 S.I.T.E, Karachi.
29. United Technologies (Pvt) Ltd.
Plot No 2 sector 20 K.I.A. Karachi.
30. Pakistan Air Force.
West Warf Karachi.
31. Cool Industries (Pvt) Ltd.
D-14 Block 2 P.E.C.H.S. Karachi.

32. Tomachi Weaving (Pvt) Ltd.
Plot 3-6 Sector 21 K.I.A, Karachi.
33. Pak Products Industries.
Plot No 1-A/7 Sector 15 K.I.A., Karachi.
34. Thal Engineering
½ Sector 22 K.I.A Karachi.
35. Singer Pakistan Ltd.
Plot 39 Sector 17 K.I.A, Karachi.
36. Rauf Electronic Equipment Service.
03 C 2/18 Nazimabad Karachi.

Hyderabad

1. M/S. United Refrigeration Industries
S.I.T.E. Hyderabad.

NAWABSHAH

1. M/S. Nawabshah National Engineering Works/Complex,
Sanghar Road Nawabshah.
2. M/S. Millat Fan Machinery, Sanghar Road, Nawabshah.

LIST OF PLASTIC AND RUBBER INDUSTRY

1. Atlas Rubber and Plastic Industry.
A- 54 S.I.T.E., Karachi
2. General Tyre and Rubber Company
H-23-2 Landhi Karachi
3. Jamshed and Sons.
C-6 Iqbal Colony Tean Hati Karachi.
4. Diamond Rubber Industry
S-45 S.I.T.E., Karachi.
5. Light Metal and Rubber Industry
A-33 S.I.T.E., Karachi.
6. Master Enterprises Ltd
S-30 S.I.T.E., Karachi.
7. Premier Rubber and Belting Mfg.
C-13 S.I.T.E., Karachi.
8. Progressive Rubber Products
S-25 Maripur Road Karachi.
9. Simplex Rubber Mfg Co Ltd.
A-23 S.I.T.E, Karachi.
10. Tyre Sole(WP) Ltd.
D-147 S.I.T.E, Karachi.

11. Taj Industries

F-20 S.I.T.E, Karachi.

12. Faiz Enterprises

D-28 S.I.T.E, Karachi.

13. Sind Rubber Products.

35 Hasking Rd Garden West Karachi.

LIST OF THE FOUNDRIES

KARACHI.

1. Pakistan Steel Mills Corporation

Bin Qasim Karachi.

HYDERABAD

1. M/S. Sitara Foundry & Engineering.

D/8 S.I.T.E Hyderabad.

SUKKUR

1. M/S. Pakistan Foundry Works Sukkur.

LIST OF METALLURGICAL INDUSTRIES

1. Abbas Steel Industries

Plot No.8 Sector 19 K.I.A, Karachi.

2. Al- Mehmood Foundary Work Shop.
F-34 S.I.T.E,Karachi.
3. Al-Burhan Steel Ltd.
LF.36 Landhi, Karachi.
4. Al Abbas Steel Ltd
Plot No.9 sector K.I.A, Karachi.
5. Wintex Industries (Pvt) Ltd.
F-300 S.I.T.E, Karachi.
6. Dada Steel Ltd.
D-178 S.I.T.E, Karachi.
7. Dewan Steel Mills
D-32 S.I.T.E, Karachi.
8. Hardware Mfg Corporation Ltd.
F-44 S.I.T.E, Karachi.
9. A.S. Steel Ltd.
F-168 S.I.T.E , Karachi.
10. Abbas Engineering Industries Ltd.
Dsu-2 Bin Qasim Karachi.
11. Ittehad Steel Industries.
D-41 A S.I.T.E, Karachi.
12. Karimi Steel Corporation
B-50 S.I.T.E, Karachi.

13. Khas-Aluminium Industries Ltd.
C-50 S.I.T.E, Karachi.
14. Metropolitan Steel Corporation.
Landhi Industrial Area Karachi.
15. Madina Re-Rolling Mills
Old Haji Camp Nishter Road,Karachi.
16. Mehboob-Re-Rolling Mills.
L-15 Block-22 F.B. Area, Karachi.
17. Mumtaz Steel Corporation
F-241 S.I.T.E, Karchi.
18. Nawab Brothers
D-41 S.I.T.E, Karachi.
19. Noman Steels
E-14/A S.I.T.E, Karachi.
20. Pakistan Steel Mills Corporation
Bin Qasim Karachi.
21. Razzak Steel Ltd.
B-30.B S.I.T.E, Karachi.
22. Steelex (Pvt)Ltd.
B-30/A S.I.T.E, Karachi.
23. Lakki Traders.
D-166 A S.I.T.E, Karachi.

24. Sadiq Re-Rolling Mills
B-13 B S.I.T.E, Karachi.
25. Standard Re Rolling Mills
F-6 S.I.T.E, Karachi.
26. Serhad Re Rolling Mills
F-92 S.I.T.E, Karachi.
27. Saif Industries Ltd.
A-67 S.I.T.E, Karachi.
28. International Industries Ltd.
Lx 15- 16 Landhi Karachi.
29. Ameerell Steel (Pvt) Ltd.
D-89 S.I.T.E, Karachi.
30. Razik Engineering Inds (Pvt) Ltd.
H-19 Industrial Area Landhi Karachi.
31. Abdullah & Sons.
D-85 A S.I.T.E, Karachi.
32. Masood Farooq Industries
F-469 S.I.T.E, Karachi.
33. Salams Steel Mills.
E-41 S.I.T.E, Karachi..
34. Shaikh Pipe Mills
F-339 S.I.T.E, Karachi.

35. H.F Steel
F-82 S.I.T.E, Karachi.

36. Aluminium Plastic Industries
Z- 2A S.I.T.E, Karachi.

37. A.B Engineering Works
Dharmsiwara Nishter road Karachi.

38. Al Sons Industries
S-18 S.I.T.E., Karachi.

39. Alstom Pakistan (Pvt) Ltd.
D-163 S.I.T.E., Karachi.

40. Abdullah and Sons (Engg and Const)
Corner Mission road Nishter Road Karachi.

41. A.B.S. Engineering Co Ltd.
F-492 S.I.T.E., Karachi

42. Adamjee Engineering (Pvt) Ltd.
Plot 1-16 Sector 20 K.I.A. Karachi

43. Aluminium Co of Pakistan Industries (Pvt) Ltd.
Plot 14 Sector 23 K.I.A., Karachi.

44. Asghar ALI
D-185 B S.I.T.E, Karachi.

45. Asad Containers(Pvt) Ltd.
A-24 S.I.T.E Karachi

46. Babar Metal Industries
E-34 S.I.T.E. Karachi.

47. Butt Engineering Ltd.
L-23/B Block 22 F.B.Area
Karachi.

48. Central Mechanical Engineering Ltd.
D-151 S.I.T.E, Karachi.

49. Diamond Industrial Enterprises.
S-45 S.I.T.E, Karachi.

50. Esbhani Industries Ltd.
D-11 S.I.T.E Karachi.

51. Fazal Industries
Wadhmal Udhaavados Road
Nanak- Wara Karachi.

52. Faran Engineering Co.
Baba-e-Urdu Road,
Karachi.

53. Fabricon Industries
Plot 246-247 Sector 24 K.I.A,
Karachi.

54. Ghulam Nabi Engineering Works.
Baghicha Hashim Khan
Garden West Khi.

55. Greesgan (Western) Ltd.
F-302 S.I.T.E, Karachi.
56. Gujrat Steel (Pvt) Ltd.
B-62 S.I.T.E, Karachi.
57. Hunain Industries MFG
Behind Dilnasheen Hotel
Megh Bhairanjee Stoff
Nishter Road Karachi.
58. Hashim Can Factory Ltd.
B-24 S.I.T.E, Karachi.
59. H.M Esmail & Co.
F- 326-355 S.I.T.E, Karachi.
60. International Tank Terminal Ltd.
Dockyard Road Khi.
61. Iqbal Engineering Corporation.
Plot 32 Sector 24 K.I.A, Karachi.
62. Jawed Engineering Co Ltd.
L-23/B Block 22 F.B.Area Khi.
63. Jilani Industrial Corporation Ltd.
F-312 S.I.T.E, Karachi.
64. Kamran Engineering Industrial Ltd.
F-86 S.I.T.E, Karachi.
65. Khokar Engineering Co.

- D-37 S.I.T.E, Karachi.
66. Kohinoor Razor Blade Factory.
D-91 S.I.T.E, Karachi.
67. K&A Industry.
D-166 S.I.T.E, Karachi.
68. Karim Containers (Pvt) Ltd.
F-33 Hub river road S.I.T.E, Karachi.
69. Kami Industries (Pvt) Ltd.
L-5/1 Block 21 F.B Area Khi.
70. Krud Sons (Pvt) Ltd.
C-7 S.I.T.E, Karachi.
71. Japan Metal Industries
D-33 S.I.T.E, Karachi.
72. Mihran Mechanical Complex Ltd.
282/283 Sector 27 K.I.A, Karachi.
73. Metal Containers Ltd.
WH-8 Sector 16/B N.Karachi.
74. Muhammedi Hardware Industries.
Plot 45 Sector 28 K.I.A, Karachi.
75. Metal Industries Ltd.
Plot 22-23 Shah Faisal Colony,
Karachi.

76. M.B.I. Industries (Pvt) Ltd.
A-51 S.I.T.E, Karachi.
77. Metalex Corporation Ltd.
D-148 S.I.T.E, Karachi.
78. Micor Engineering
C-192 Block J N.Nazimabad,
Karachi.
79. M.R.Industries.
24/2 Sector 6-A North Karachi.
80. Landhi Metal Ltd.
Plot No 122 Sector 27 K.I.A. Karachi.
81. Landhi Engineering Works Ltd.
15th Mile Hyderabad Road,
Karachi.
82. National Container Ltd.
F-S.I.T.E, Karachi.
83. Mehran Metal Containers.
Plot 232 Sector 23 K.I.A, Karachi.
84. Pakistan Metal Industries.
E-19 S.I.T.E, Karachi.
85. Pakistan Welding Electrodes Fty.
E-10 S.I.T.E, Karachi.
86. Pervez Engineering Industries

M II-E-1042 Block-C Shershah Karachi.

87. P.I.A. Engineering & Maintenance
Admn Manager Isphni H

88. Pakistan Steel Fabricating Co Ltd
PSF Admn Bldg 1 Bin Qasim.

89. Peerji Industries.
B 33/A S.I.T.E, Karachi.

90. Rafiuddin& Sons.
Akbar Ali Building Bhimpura
Lawrance Road Karachi.

91. Razzak Engineering Co Ltd.
A-65 S.I.T.E, Karachi.

92. Raja Engineering Co Ltd.
Plot 259 260 Sector 27 K.I.A, Karachi.

93. Sigma Industries (Pvt) Ltd.
Plot 25 Sector 28 K.I.A, Karachi.

94. Shahab Industries Ltd.
E 30 S.I.T.E, Karachi.

95. Skyways Manufacturing Ltd.
A-1 A-3 E S.I.T.E, Karachi.

96. Sun Engineering Works.
Udha-Vadas Tarachand Street
Nishter Road Karachi.

97. Sindh Engineering Ltd.
West Wharf Road Karachi.
98. Singer Industries Ltd.
Plot 39 Sector 19 K.I.A, Karachi
99. Salika Sewing Machine Co.
D-141 B S.I.T.E, Karachi.
100. Simpson & Wire Ltd.
L-16 Block 21 F.B. Area Karachi.
101. Schindler Futheally &Merin Ltd.
LA 8 A Block 22 F.B. Area Karachi.
102. Sun Beam Engineering Ltd.
1.B.3 Sector 15 K.I.A, Karachi.
103. Standard Kans (Pvt) Ltd.
29/2 Sector 6-A N. Karachi
104. S.S. Engineering
19/9 Alighar Housing Society Karachi.
105. Taj Industries Corporation.
L-5 Block 21 F.B. Area Karachi.
106. Thermax (Pvt) Ltd.
Plot No 162 Sector 24 K.I.A, Karachi.
107. Wasim Brothers.
Mission Road Karachi.

108. Yousuf Industries (Pvt)Ltd.
B-64 S.I.T.E, Karachi.
109. Zamin Containers Industries.
D-140 B S.I.T.E, Karachi.
110. Pressed Steel Industries.
F-77 S.I.T.E, Karachi.
111. New Ideal Co.
B 33/A S.I.T.E, Karachi.
112. Pakistan Machine Tool Factory.
Juma 6th Railway Street Karachi.
113. Omer Jibran Engineering Industries Ltd.
DSU 10 Pakistan Steel Industries Estate
Bin Qasim Zulfiqar Abad Karachi.
114. Mehran Engineering Works.
322 West Wharf Road.
115. Savannah.
67 C 12th Commer st D.H.A. Karachi.
116. Mumtaz Engineering.
WS 5 Block 14 F.B Area Karachi.
117. Sea Gull Engineering.
L-10 C Block 22 F.B. Area Karachi.
118. Ali Brother Engineering.

F-583 S.I.T.E, Karachi.

119. Electro Polymar (Pvt) Ltd.

Plot No 14 Sector 5/A N. Karachi.

120. S.S. Engineering.

Plot No 19/9 Aligarh Colony ,
Orangi Town Karachi.

121. Oxyplast Pakistan Ltd.

C-47 Saifullah plot Karachi.

122. M.N.J. Engineering (Pvt) Ltd.

FS Sector 50 c Korangi.

123. Metal Engineering Complex (Pvt) Ltd.

Landhi Industries Area Khi.

124. Engineering Concern (Pvt) Ltd.

Plot No 159 Sector 23 K.I.A, Karachi.

125. Mehran Metal Containers (Pvt) Ltd.

Plot 232 Sector 23 K.I.A, Karachi.

126. Chiragh sin Engineering Ltd.

DSU 4 Pakistan Steel mills.

127. Axle Products Ltd.

Bin Qasim Karachi.

128. Map International.

LLT-26-A Landhi Industrial Area.

129. Comet Enterprises.
F-410 S.I.T.E, Karachi.
130. Allied Engineering & Services Ltd.
Plot 21/3 Sector 22 K.I.A, Karachi.
131. Precision Rubber Products.
Plot 24 Sector 48 K.I.A, Karachi.
132. Farrell Engineering (Pvt) Ltd.
Plot 176 Sector 23 K.I.A, Karachi.
133. Trecon Services (Pvt)Ltd.
Plot No 38th West Wharf Road Karachi.

HYDERABAD

- 1.M/S. Al-Noor Trading Company
Usmanabad Hyderabad.
- 2.M/S. Alam & Brother Station Road Hyderabad.
- 3.M/S. Sind Metal Containers Ltd,
A/24 S.I.T.E, Hyderabad.
4. M/S. Mehran Iron & Steel Re-Rolling
S.I.T.E, Hyderabad.
5. M/S. Basharat Steel Re-Rolling
S.I.T.E, Hyderabad.
6. M/S. Treet Corporation Mills

Hali Road Hyderabad.

7. M/S. Crescent Steel & Allied Products.
Nooriabad.

DADU

1. M/S Indus Steel Pipe Mills
S.I.T.E, Kotri.
2. M/S. Atlas Cables Ltd
S.I.T.E, Kotri.
3. New Delite Industries
S.I.T.E Kotri.

SUKKUR

1. M/S. Mistry Rasool Bux & Sons Sukkur.
2. M/S. Pir Bux Brothers Sukkur.

LIST OF ELECTRPLATING INDUSTRIES

1. Atlas Battery Ltd.
D-181 S.I.T.E, Karachi.
2. Exide (Pak) Ltd.
A 45 S.I.T.E., Karachi

IN SERVICE POWER TRANSFORMERS AT GRID STATIONS

AS ON 30th JUN. 05

S.NO.	GRID STATION	NO.	TRANSFORMERS	MAKE	DATE OF ENERGIZATION
1	Airport	1	31.5 / 40 mva 1	Hyundi	16-aug-99
		2	31.5 / 40 mva2	Siemens (new)	27 -aug-04
		3	20 mva 3	Siemens	5-jun-99
2	Baldia	4	40 mv a 1	Siemens	29-sep-97
		5	30 mv a 2	Toshiba	25-nov-02
		6	31 .5 / 40 mv a 3	Hec	30-nov-04
3	baloch colony	7	30 mv a 1	Electro putere	12-nov-00
		8	30 / 39 mva2	Elta	13-sep-88
		9	30 / 39 mv a 3	Elta	14-mar-89
4	Boc	10	20 mva	Bbc	25-aug-97
5	Caa	11	30 mv a 1	Siemens	18-dec-91
		12	30 mv a 2	Siemens	18-dec-91
		13	30 / 39 mv a 3	Siemens	24-mar-95
6	Civic center	14	30 mv a 1	Siemens	18-oct-92
		15	31.5 / 40 mva 2	Hyundai	. 30-aug-97
		16	31.5 / 40 mva 3	Hyundai	27 -nov-97
7	Clifton	17	30 mva 1	Siemens	07 -nov-93
		18	30 mv a 2	Hyundai	Jul-98
8	Defence	19	30 mv a 1	Electro putere	14-dec-00

		20	31.5 / 40 mva 2	Hyundai	2-feb-97
9	dhabeji	21	31 .5 / 40 mv a 1	Hyundai	10-jan-96
		22	20 mva 2	Bbc	1969
10	New elender rd	23	31.5 / 40 mva 1	Hyundai	13-jun-99
		24	30 mv a 2	Siemens	30-Oct-99
11	Federal b	25	30 mv a 1	Trafo union	10-Oct-78
		26	30 / 39 mv a 2	Elprom en ergo	16-nov-86
		27	40 mv a 3	Bbc	Sep-80
		28	30 / 39 mv a 4	Elta	25-jun-88
12	Garden east	29	31.5 / 40 mva 1	Hyundai	7 -dec-98
		30	31.5 /40 mva2	Hec	26-Oct-04
13	Gharo	31	20 mva	Bbc	Mar-70
14	Gizri	32	30 / 39 mva 1	Elta	Apr-89
		33	30 mv a 2	Siemens	Jul-94
		34	30 / 39 mv a 3	Elprom energo	Jun-87
16	Gulist an e johar	35	31 .5 / 40 mv a 1	(hec) Syeny ang	17 -mav-oo
		36	31.5 /40 mva2	(hec) Syeny ang	27 -jun-04
17	Gulshan	37	30 mv a 1	Electro putere	6-mav-03
		38	30 mv a 2	Siemens	17-.jul-97
		39	31.5 / 40 mv a 3	Hyundai	4-jan-97
		40	40 mv a 4	Siemens	1-mav-04

21	Hub chowki	41	20 mva 1	Smit	14-mar-00
		42	20 mv a 2	Siemens	1985
22	Jacobline	43	30 mv a 1	Siemens	11-nov-93
		44	30 mv a 2	Siemens	11-nov-93
		45	31.5 / 40 mva3	Hyundai	29-jun-97
23	Kepz	46	20 / 26 mv a 1	Asea	12-dec-94
		47	20 / 26 mva2	Asea	12-jul-98
24	Kda	48	30 mv a 1	Bbc	8-jun-88
		49	30 / 39 mva2	Siemens	30-aug-96

NWFP

PCBs

Trade names of PCB products included:

Aroclor (US)

Kanechlor (Japan)

Pyranol (US)

Santotherm (Japan)

Pyroclor (US)

Fenchlor (Italy)

Phenoclor (France)

Apirolio (Italy)

Pyralene (France)

Clophen (Germany)

Sovol (USSR)

Elaol (Germany)

3 USES OF PCBs

The PCBs were used in a very wide variety of applications in both industrial and consumer products. The WHO categorized the uses as completely closed, nominally closed and open-ended (IPCS, 1992). The uses can be summarized as:

3.1 COMPLETELY CLOSED SYSTEMS

- a. Electrical transformers
- b. Electrical capacitors (including lamp ballasts)
- c. Electrical switches, relays and other
- d. Electrical cables

3.2 NOMINALLY CLOSED SYSTEMS

- a. Hydraulic systems
- b. Heat transfer systems (heaters, heat exchangers)

3.3 OPEN-ENDED SYSTEMS

- a. Plasticizer in PVC, neoprene, and other artificial rubbers
- b. Ingredient in paint and other coatings
- c. Ingredient in ink and carbonless copy paper
- d. Ingredient in adhesives
- e. Pesticide extender
- f. Ingredient in lubricants and sealants
- g. Fire retardant in fabrics, carpets, polyurethane foam, etc.

Annex-A

SUMMARY OF TRANSFORMERS AT POWER GENERATION SITES

Sr. No.	Name of Circle	Power House	Power (MVA)	No. of Transformers	Total Power of Transformers (MVA)
1	Tarbela Power Station	Unit 1-4	79	13	1027
		Unit 5-10	71	20	1420
		Unit 11-14	150	13	1950
		Interconnector Transformer	79	7	553
	Tarbela Switchyard	Service Transformers	10	10	100
	Sub-Total			63	24507
	Warsak Circle				
		Warsak	13.3	12	159.6
		Warsak	48.8	2	97.6
		Dargai	15	2	30
		Dargai	12.5	1	12.5

		Malakand	3.75	3	11.25
		Malakand	6	2	12
		Kurram Ghari	2.5	1	2.5
		Kurram Ghari	1.56	4	6.24
	Sub-Total			27	2792.07
	Grand Total			90	44316.9

OIL CAPACITY OF DIFFERENT POWER TRANSFORMERS

S.No.	Type of Transformer	Quantity of Oil Used in Tones
1	40 MVA	28 Tones
2	20/26 MVA	18 Tones
3	20/26 MVA	15 Tones
4	20/26 MVA	17.9 Tones
5	10/13 MVA	16.5 Tones

OIL CAPACITY OF DIFFERENT DISTRIBUTION TRANSFORMERS

S.No.	Type of Transformer	Quantity of Oil Used in Liters	Quantity of Oil Used in Tones*
1	25 KVA	80	0.064
2	50 KVA	121	0.0968
3	100 KVA	180	0.144
4	100/33 KVA	410	0.328
5	200 KVA	300	0.24
6	200/33 KVA	480	0.384

* 1 liter of transformer oil is equal to 0.8 Kg.

**STATEMENT SHOWING DETAILS OF POWER TRANSFORMERS
UNDER GSO CIRCLE PESCO PESHAWAR**

I. SS&TL Division, PESCO Peshawar

Sr. No.	Name of Grid Station	Code No.	Date of Comm;	Make	MVA Capacity	Voltage Ratio
1	66 KV Alizai	T-I	27-01-2002	China	10/13	66/11KV
2	66KV Bada Ber	T-I	03-04-2003	GE (USA)	7.5	66/11 KV
		T-2	04-06-1976	Legnano	10	66/11 KV
3	132 KV Bara	T-I	20-8-2000	China	20/26	132/11 KV
		T-2	07-03-2003	HEC	20/26	132/11 KV
4	132 KV Peshawar Cantt	T-I	07-03-2001	Electroputer	20/26	132/11 KV
		T-2	19-4-1996	Electroputer	20/26	132/11 KV
5	132KV Charsadda	T-I	12-08-2003	HEC	20/26	132/11 KV
		T-2	20-1-1990	Ganz	20/26	132/11 KV
6	132KV Dalazak	T-I	09-08-2002	Elprom	10/13	132/11 KV
7	132 KV Peshawar City	T-1	08-07-1989	Ganz	20/26	132/11 KV
		T-2	21-8-1989	Ganz	20/26	132/11 KV
		T-3	13-12-2003	HEC	20/26	132/11 KV
8	132.KV Peshawar Fort	T-3	07-01-1996	Electroputer	20/26	132/11 KV
		T-4	06-12-1997	Siemens	20/26	132/11 KV
9	66KV Ghallanai	T-1	22-02-1988	Rade-Koncar	10/13	66/11 KV
		T-2	28-10-1993	Rade':Koncar	10/13	66/11 KV
10	132KV Gumbat	T-1	25-1-1996	Electroputer	10/13	132/11 KV
11	66 KV Hangu	T-I	23-10-1982	Elprom	10/13	66/11 KV
		T-2	06-01-1996	China	10/13	66/11 KV
12	132 KV Hayatabad	T-I	21-5-2001	Siemens	10/13	132/11 KV
		T-2	08-05-2004	Siemens	20/26	132/11 KV
13	132 KV, Peshawar Industrial	T-I	04-10-1990	Ganz	20/26	132/11 KV
		T-2	04-10-1984	Meiden Sha	20/26	132/11 KV
		T-3	08-04-2000	ElpI:om	10/13	132/11 KV

Sr. No.	Name of Grid Station	Code No.	Date of Comm;	Make	MVA Capacity	Voltage Ratio
14	132 KV Jamrud	T-1	12-12-1987	Elta	20/26	132/11 KV
		T-2	23-12-1983	Insaldo	20/26	132/11 KV
		T-3	28-03-2000	China	20/26	132/11 KV
15	66 KV Kalaya	T-1	24-10-1985	Elta	10/13	66/11 KV
		T-2	01-03-2003	Electroputer	6.3	66/11 KV
16	66 KV Kohat	T-1	14-01-1998	Electroputer	6.3	66/11 KV
		T-2	14-01-1965	Insaldo	3	66/11 KV
17	132 KV Kohat	T-I	30-11-1989	Ganz	20/26	132/11 KV
		T-2	27-04-1993	Electroputer	20/26	132/11 KV
		T-3	12-07-1983	Elta	31.5/40	132/66 KV
		T-4	17-08-2003	HEC	20/26	132/11 KV
18	132 KV Lachi	T-1	15-03-2002	CGE Millano	15	132/11 KV
19	66 KV Lakarai	T-I	17-06-1905	China	6.3	66/11 KV
		T-2	22-06-1905	China	10/13	66/11 KV
20	132 KV Landikotal	T-I	12-12-1989	Insaldo	10/13	132/11 KV
		T-2	31-03-1996	Siemens	20/26	132/11 KV
21	132KV Mattani	T-I	30-06-1996	AEG	5.4	66/11 KV
		T-2	01-05-1995	Siemens	10/13	132/11 KV
		T-3	22-10-2002	Electroputer	20/26	132/11 KV
22	132 KV Pabbi	T-3	14-1-1990	Electroputer	20/26	132/11 KV
		T-4	28-06-1994	Elprom	10/13	132/11 KV
23	132 KV Parachinar	T-1	31.12.2003	HEC	20/26	132/11 KV
		T-2	31.12:2003	Electroputer	10/13	132/11 KV
24	132 KV Rehman Baba	T-I	16-06-2003	Electroputer	10/13	132/11 KV
25	66 KV Sadda	T-1	29-10-1995	Elprom	10/13	66/11 KV
26	132 KV Shabqadar	T-1	15-01-1995	Elprom	10/13	66/11 KV
		T-2	28-02-2000	China	31.5/40	132/66 KV
		T-3	13-03.-1998	Siemens	20/26	132/11 KV
		T-4	10-01-1992	CGE Italy	10/12.5	132/11 KV
27	132 KV Shahibagh	T-1	02-06-1905	Trafo Union	10/13	132/11 KV
		T-1	04-06-1905	Elta	30/37.5	132/66 KV
		T-3	07-03-2000	China	20/26	132/11 KV
		T-4	23-07-1976	Panvels	30/37.5	132/66 KV

Sr. No.	Name of Grid Station	Code No.	Date of Comm;	Make	MVA Capacity	Voltage Ratio
		T-5	14-08-1989	Ganz	20/26	132/11 KV
28	132 KV Sakhi Chashma	T-1	29-05-2000	Elprom	10/13	132/11 KV
		T-2	05-07-2003	Minal	10/13	132/11 KV
29	132 KV Tangi	T-1	30-09-2004	Siemens	20/26	132/11 KV
		T-2	14-11..1995	China	20/26	132/11 KV
30	132KV Tall	T-1	22-08-1991	Siemens	30/37,5	132/66 KV
		T-2	22-08-1991	Rade-Koncar	10/13	132/11 KV
		T-3	31-07-2000	Toshiba	10/13	132/11 KV
31	132 KV Pesh: University	T-1	23-07-1996	Siemens	20/26	132/11 KV
		T-2	10-08-1988	Elta	20/26	132/11 KV
		T-3	1 9-06-1997	Rade-Koncar	10/13	132/11 KV
32	66 KV Warsak	T-1	05--06-2003	Elprom	10/13	66/11KV
		T-2	24-05-1998	Elprom	10/13	66/11KV
33	66KV Ghilio	T-1	31-08-2003	Elprom	7.5	66/11KV
34	132 KV Bannu	T-1	21-04-1988	Legnano	159/10.7/525	132/66/33 KV
		T-2	16-1-1981	Legnano	159/10.7/526	132/66/33 KV
		T-3	30-12-1989	Ganz	20/26	132/11KV
		T-4	05-09-1999	H.E.C	20/26	132/11KV
35	66 KV Bandkurai	T-1	14-2-1974	GE (USA)	5	66/11KV
		T-2	25-12-1993	Elprom	7.5	66/11KV
36	132KV DIKhan	T-1	27-11-2000	Electroputer	20/26	132/11KV
		T-2	17-11-1992	Electroputer	31.5/40	132/66 KV
		T-3	06-07-1992	Electroputer	20/26	132/11KV
37	66 KV Draban	T-1	12-02-1987	AEG	5	66/11KV
38	132 KV Gurguri	T-1	13-04-1996	Elprom	6.3	132/11KV
39	66 KV Jandola	T-1	18-10-1981	Elprom	5/6.9	66/33 KV
		T-2	25-06-1987	Asea	7.5	66/11KV
		T-3	04-02-2003	Etprorn	6.3	66/33 KV
40	66 KV Klilachi	T-1	08-11-1986	GE(USA)	5	66/11KV
41	66KV Kurram Garhi	T-1	0 1-03 1976	Millmio	5	66/33KV
		T-2	12-10-1993	Electroputer	10/13	66/11KV
42	132 KV Karak	T-1	31-10-1987	Gani	10/13	132/11KV
		T-2	11-11-2003	Elta	20/26	132/11KV

Sr. No.	Name of Grid Station	Code No.	Date of Comm;	Make	MVA Capacity	Voltage Ratio
43	132 KV Mir Ali	T-I	17-05-1995	Siemens	10/13	132/11KV
44	132 KV Miran Shah	T-I	27-02-1992	Electroputer	20/26	132/11KV
		-2 T	30-12-1996	Elprom	10/13	132/11KV
45	132 KV Prova	-I T	03-06-1978	Legnano	7.5	132/11KV
46	66 KV Pezu	-I T	28-06-1989	M ilIano	5	66/11KV
47	132 KV Razmak	-I T	23-04-2001	Insaldo	10/13	132/11 KV
48	66 KV S/Naurang	-1 T	30-06-2002	Elprom	10/13	66/11 KV
49	132 KV Tank	-4 T	17-12-1989	Insatdo	10/13	132/11 KV
		-5 T	08-01-1993	Electroputer	31.5/40	132/66 KV
		-6 T	30-08-2001	Trafo-Union	10/13	132/11 KV
50	66 KV Tajazai	-1 T	06-03-1996	Ganz	15	66/11 KV
		-2 T	09-01-1991	oDuter Electr	6.3	66/11 KV
51	66 KV Wana	-1 T	24-05-1997	(USA) GE	6.3	66/11 KV
		-2 T	23-06-1993	oDuter Electr	10/13	66/11 KV
52	66 KV Tank	-1 T	11-08-1985	Asea	2.5	Load shifted to 132KV GSS Tank

III. SS&TL Division, PESCO Mardan

Sr. No.	Name of Grid Station	Code No.	Date of Comm;	Make	MVA Capacity	Voltage Ratio
53	132 KV Swat	T-1	05-06-1998	Siemens	20/26	132/11 KV
		T-2	24-08-1994	Electroputer	20/26	132/11 KV
		T-3	20-10-1986	Elprom	7.6	132/33 V
		T-4	05-11-1984	Elprom	7.6	132/11 KV
54	132 KV Chakdara	T-1	02-04-1993	Elta	40	132/66 KV
		T-2	15-07-1985	Toshiba	10/13	132/11 KV
		T-3	24-01-2001	Minel	20/26	132/11 KV
55	132 KV Timergara	T-1	18-01-1996	Electroputer	40	132/66 KV
		T-2	29-06-1996	Siemens	10/13	132/11 KV
56	132 KV Nowshera City	T-1	04-01-2000	Ganz	20/26	132/11 KV
		T-2	02-02-1976	Pauwal	37.5	132/66 KV
		T-3	24-12-1986	Elprom	10/13	132/11 KV
57	132.KV Jehangira	T-1	14-09-1981	Asgen	15	132/11KV
		T-2	01-08-2001	Electroputer	20/26	132/11KV
58	132KV Swabi	T-1	28-09-2000	Electroputer	20/26	132/11KV
		T-2	31-10-1989	Ganz	20/26	132/11KV
59	132KV G/Amazai	T-1	11-04-1991	Electroputer	20/26	132/11KV
		T-2	10-03-1991	Electroputer	20/26	132/11 KV
60	132 KV Khwaza Khela	T-1	29-08-2003	CGE.	10/12.5	132/11KV
61	132 KV R.B. Tarbela	T-1	22-02-1991	Electroputer	20/26	132/11KV
		T-2	01-01-2003	Siemens	10/13	132/11 KV

Sr. No.	Name of Grid Station	Code No.	Date of Comm;	Make	MVA Capacity	Voltage Ratio
62	132 KV Jalala	T-4	28-03-1998	Elta	10/13	132/11 KV
		T-3	06-07-1999	Elprom	10/13	132/11 KV
63	132 KV Nowshera Indl	T-1	27-04-1994	China"	20/26	132/11 KV
		T-2	16-02-2002	Rade-Koncar	10/13	132/11 KV
64	132 KV Nizampur	T-1	13-09-1990	Toshiba.	10/13	132/11 KV
65	132 KV Mardan-2	T-1	17-05-1995	Rade-Koncar	0/13	132/11 KV
		T-2	27-06-2002	Insaldo	10/13	132/11 KV
66	132 KV Madyan	T-1	07-01-2004	BBC	10/13	132/11 KV
67	132/6 KV Dargai	T-1	27/5/1976	Elprom	10/13	66/11 KV
		T-2	14-10-1998	Toshiba	10/13	132/11 KV
68	66 KV Jalala	T-1	19-02-1992	Elprom	10/13	66/11KV
69	66 K V Bajawar	T-1	29-01-1987	Elta	10/13	66/11KV
		T-2	21-08-1991	Electroputer	10/13	66/11KV
		T-3	10-04-2003	Elprom	10/13	66/11KV
70	66 KV Timergara	T-I	16-11-1977	Elprom	5/6.3	66/33 KV
		T-2	30-06-1990	China	10/13	66/11 KV
71	66 KV Hussai	T-1	28-11-1989	Elprom	10/13	66/11 KV
		T-2	08-05-1999	Electroputer	10/13	66/11 KV
72	66 KV Daggar	T-1	09-07-1983	Elprom	10/13	66/11 KV
		T-2	13-11-2003	Electroputer	6.3	66/11 KV
73	66 KV Dir	T-1	28-07-1997	Elprom	10/13	66/11 KV

Sr. No.	Name of Grid Station	Code No.	Date of Comm;	Make	MVA Capacity	Voltage Ratio
		T-2	16-10-1995	Elprom	5/6.3	66/33 KV
74	66 KV Mardan	T-I	27-01-1997	Elprom	5	66/11 KV
75	166 KV Khashki	T-1	13-05-1905	J&P	2.5	66/3.3 KV
76	66 KV Wari	T-I	20-05-2003	Elprom	10/13	66/11 KV
77	33 KV Jutilasht (Chitral)	T-1	--	Siemens	4	33/11 KV
78	33 KV Dorsh (Chitral)	T-1	13-05-2001	Siemens	1.5	33/11 KV

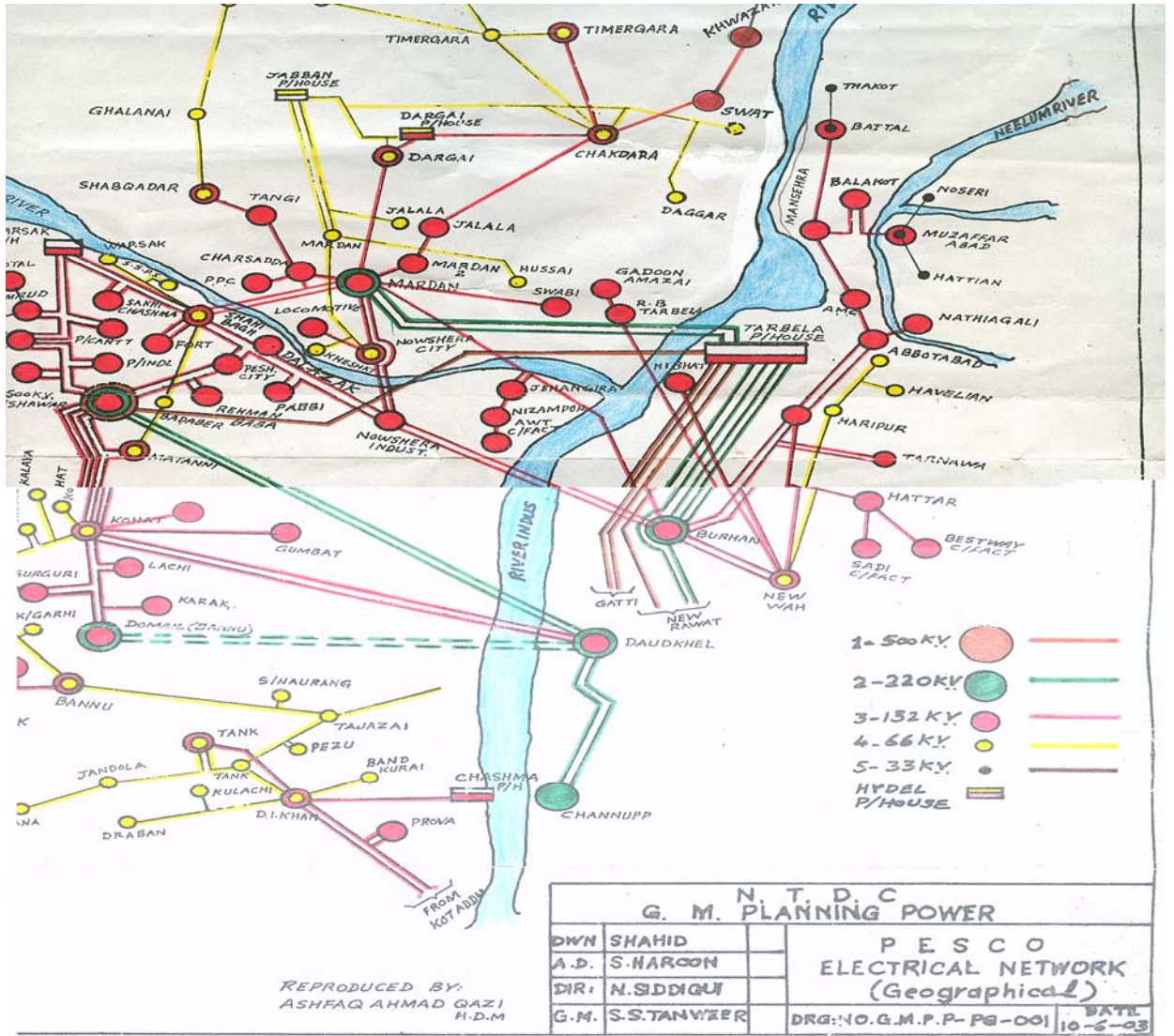
IV. SS&TL Division, PESCO Abbottabad

Sr. No.	Name of Grid Station	Code No.	Date of Comm;	Make	MVA Capacity	Voltage Ratio
79	132KV Abbottabad	T-1	30-05-1999	Electroputer	20/26	132/11 KV
		T-2	30-06-1992	Elta	10/13	132/11 KV
80	132 KV AMC A/Abad	T-I	25-06-1992	Elprom	10/13	132/11 KV
81	132 KV Battal	T-I	29-06-1994	Asgen	1.5	132/11 KV
		T-2	01-02-2003	Elprom	10/13	132/33 KV
82	132 KV Balakot	T-1	30-10-1988	OTE'	10/13	132/11 KV
		T-2	01-08-1989	Elprom	6.3/7.6	132/33 KV
83	132 KV Haripur	T-3	29-08-1987	Ganz	10/13	132/11 KV
		T-4	26-11-1989	Ganz	20/26	132/11 KV
84	132 k V Hattar	T-1	31-05-1999	Siemaos	20/26	132/11 KV
		T-2	23-09-200 I	Siemens	20/26	132/11 KV
85	132 KV Manshera	T-1	68-10-1980	Trafo-Union,	10/13	132/11 KV
		T-2	24-10-2000	China	20/26	132/11 KV
86	132 KV Nishat Tarbela	T-1	12-07-1991	CerE	15	132/11 KV
		T-2	05-03-1999	Elpron	10/13	132/11 KV
87	132 KV Nathia Gali	T-1	15-05-2002	Siemens	10/13	132/11 KV
88	66 KV Abbottabad	T-1	12-07-1991	Electroputer	10/13	66/11 KV
		T-2	25-05-1977	Asea	2.5	66/33 KV
89	66 KV Haripur	T-1	21-06-1996	GE (USA)	5.6	66/11KV
		T-2	15-01-1999	China	6,5	66/11KV
90	66 KV	T-1	10-06-1905	Elprom	10/13	66/11KV

	Havelian	T-2			5/625	66/11KV
91	33 KV Thakot	T-1	14-04-2001	Siemens	4	33/11 KV
		T-2	24-11-2003	Siemens	4	33/11 KV

Annex-E

Map Showing Location of Power Transformers Under GSO Circle PESCO Peshawar



Annex-F

**DETAILS OF TRANSFORMER OIL SAMPLES COLLECTED IN NWFP FOR
PCBS ANALYSIS ALONG WITH OIL TESTING RESULTS**

S.No	Sample No	Description of Oil Sample	Color Matching	Result
1.	2	132 KV, Mingora Swat-1 (Used)	2 nd Color	<50 PPM
2.	22	132 KV, Mingora Swat-2 (Used)	4 th Color	<50 PPM
3.	3	132 KV, Chackdara-2 (Used)	5 th Color	>50 PPM
4.	5	132 KV, R.B. Tarbela	4 th Color	<50 PPM
5.	4	132 KV, Kohat City.	5 th Color	>50 PPM
6.	6	132 KV, Karak	3 rd Color	<50 PPM
7.	7	132 KV Bannu, Sample 1 (Dehydration Plant)	2 nd Color	<50 PPM
8.	9	66 KV, Sara-e-Naurang	3 rd Color	<50 PPM
9.	11	132 KV, Charsadda (New) Sample 1	3 rd Color	<50 PPM
10.	14	132 KV, Jalala – Mardan, Used Sample 2	5 th Color	>50 PPM
11.	15	132 KV, Tangi – Charsadda, Used Sample 1	2 nd Color	<50 PPM
12.	8	Private Transformer Repair Shop, Near New Adda Bannu	2 nd Color	<50 PPM
13.	20	Transformer reclamation workshop Nowshehra, (Simens 50KVA) Used	5 th Color	>50 PPM
14.	36	Transformer reclamation workshop Nowshehra, (Simens 200KVA) Used	5 th Color	>50 PPM

15.	41	Transformer reclamation workshop Nowshehra, {Transpale (not readable) 50KVA} Used	3 rd Color	<50 PPM
16.	24	Transformer reclamation workshop Nowshehra, (Pel 50KVA) Used	3 rd Color	<50 PPM
17.	37	Inside roofed building of workshop (stagnant on ground)	3 rd Color	<50 PPM
18.	35	Inside premises of the workshop	5 th Color	>50 PPM
19.	18	Dehydration plant (American)-I	3 rd Color	<50 PPM
20.	19	Dehydration plant (American)-I	2 nd Color	<50 PPM
21.	32-	Dehydration plant (American)-II	3 rd Color	<50 PPM
22.	30	Dehydration plant (American)-II	4 th Color	<50 PPM
23.	21-	Dehydration plant (K2)	2 nd Color	<50 PPM
24.	40	Dehydration plant (K2)	3 rd Color	<50 PPM
25.	31	Warranty oil (composition not suitable for use and required regeneration)	5 th Color	>50 PPM
26.	26	Tank # 1 (Dehydrated through American Plant)	5 th Color	>50 PPM
27.	39	Transformer Reclamation workshop Nowshehra, (Pel-B-274 50KVA) Used	1 st Color	<50 PPM
28.	42	Transformer Reclamation workshop Nowshehra, (not known) Used	3 rd Color	<50 PPM
29.	23	Transformer Reclamation workshop Nowshehra (from Drum inside the roofed building) used	5 th Color	>50 PPM
30.	25	Transformer Reclamation workshop Nowshehra (from Drum outside the roofed building) used	5 th Color	>50 PPM
31.	33	Unknown Transformer, Transformer Reclamation workshop Nowshehra, used	5 th Color	>50 PPM
32.	29	132 KVA Nowshehra city, Breaker 66	3 rd	<50 PPM

		KV	Color	
33.	63	Power House, Warsak, Peshawar. 1-6 Unit having same kind of Transformers (Ferrmti-Packard Electric Limited Toronto Canada, Oil capacity=17590 LBS, total weight=74780LBS) Used	4 th Color	<50 PPM
34.	66	Refrigent oil 4-GS, Power House, Warsak, Peshawar. New	2 nd Color	<50 PPM
35.	64	Power House, Warsak, Peshawar. (Canadian General Electric 645 KVA, total weight=17250 lbs, Oil weight=1350LBS, year of manufacturing 1978, The transformer is abandoned for the last one year with the instruction that no one should touch it because it contain poison, another transformer of same specification is currently in use on power generation site)	Test Stopped	Pure PCB
36.	17	Not Known, Power House, Warsak, Peshawar. (There are instruction for the transformer that no one should touch it because it contain very dangerous oil, the transformer is currently in use on power generation site)	Stopped	Pure PCB
37.	53	T-5, GANZ 20/26 MVA 132/11 KV, Regional Control Center (RCC), Shahi Bagh, Peshawar	3 rd Color	<50 PPM
38.	62	Processed sample from Dehydration Plant inside the Regional Control Center (RCC), Shahi Bagh, Peshawar	2 nd Color	<50 PPM
39.	58	Turbine oil T-68, Power House, Tarbela, Used	3 rd Color	<50 PPM
40.	60	HT Breaker oil, Power House, Tarbela.	3 rd Color	<50 PPM
41.	54	Transformer oil, Power House, Tarbela. (Store drum provided by PSO) New.	3 rd Color	<50 PPM
42.	56	T-4, Power House, Tarbela, Used	3 rd Color	<50 PPM

43.	55	T-3, Power House, Tarbela, Used	2 nd Color	<50 PPM
44.	68	T-1, Power House, Tarbela, Used	3 rd Color	<50 PPM
45.	52	T-1, Power House, Tarbela, Used	1 st Color	<50 PPM
46.	1	132 KV, Peshawar City (used)	3 rd Color	<50 PPM
47.	10	132 KV Haripur	4 th Color	<50 PPM
48.	12	132 KV Mansehra	3 rd Color	<50 PPM
49.	13	132 KV Abbottabad	3 rd Color	<50 PPM
50.	16	132 KV, Peshawar Fort, Used	2 nd Color	<50 PPM
51.	34	132 KV, Hayat Abad, Peshawar, Used	4 th Color	<50 PPM

1. <50 PPM = Below Fifty Parts Per Million
2. >50 PPM= Above Fifty Parts Per Million

Annex-G

Details of PCB Contaminated Soil Samples Collected in NWFP for PCBs Analysis along with Testing Results

S.No	Sample No	Description of Soil Sample	Color Matching	Result
1	1	Inside store of oil, Power House, Warsak, Peshawar.	5 th Color	>50 PPM
2	2	Outside store of oil, Power House, Warsak, Peshawar.	5 th Color	>50 PPM
3	3	Transformer Reclamation Workshop, Nowshehra (Inside building)	4 th Color	<50 PPM
4	4	Transformer Reclamation Workshop, Nowshehra (out-side building but inside the premises)	3 rd Color	<50 PPM
5	5	Transformer Reclamation Workshop, Nowshehra (out-side building but inside the premises)	4 th Color	<50 PPM
6	6	Transformer Reclamation Workshop, Nowshehra (out-side building but inside the premises)	2 nd Color	<50 PPM
7	8	Chackdera-2 (lower Dir)	3 rd Color	<50 PPM
8	9	Swat-1	5 th Color	>50 PPM
9	12	Bannu Privet repair Workshop (Chungi, near bus-stand)	5 th Color	>50 PPM
10	14	Bannu 132KV, Naurang road Bannu city	2 nd Color	<50 PPM
11	15	Kohat City 132kv	4 th Color	<50 PPM
12	17	Tangi T-2 (Charsadda)	2 nd Color	<50 PPM
13	19	Charsadda	2 nd Color	<50 PPM
14	20	Jalala-1 (Mardan)	2 nd Color	<50 PPM
15	23	Near by the damage transformer 20/26 MVA which is abandon for the last 4 four years, Regional Control Center (RCC), Peshawar	3 rd Color	<50 PPM
16	24	Near by T-2, ELTA 30/37 MVA 132/66 KV, Regional Control Center (RCC), Peshawar	2 nd Color	<50 PPM
	25	Dehydration Plant site, inside the	3 rd Color	<50 PPM

7	Regional Control Center (RCC), Peshawar		
---	---	--	--

1. <50 PPM = Below Fifty Parts Per Million
2. >50 PPM= Above Fifty Parts Per Million

Annex-H

Sampling and Analysis Schedule for PCBs at Different Power Generation Sites

S. No	Name of Circle	Location	Total Nos of Transformers	Nos of Oil sample required	Nos of soil sample required
	Tarbela Circle	Tarbela Power Station and Switchyard	63	7	0
	Warsak Circle	Warsak Dam	14	4	2
Total			85	11	2

SAMPLING SCHEDULE OF POWER TRANSFORMERS UNDER GSO CIRCLE PESCO PESHAWAR

1. Sampling and Analysis Schedule for PCBs at SS&TL Division, PESCO Peshawar

No	Name of District	Location	Total Nos of Transformers	Nos of Oil sample required	Nos of soil sample required
	Peshawar	66 KV Alizai	1	-	-
		66KV Bada Ber	2	-	-
		132 KV Bara	2	-	-
		132 KV Peshawar Cantt	2	-	-
		132KV Dalazak	1	-	-
		132 KV Peshawar City	3	1	-

		132.KV Peshawar Fort	2	1	-
		132 KV Hayatabad	2	1	-
		132 KV, Peshawar Industrial	3	-	-
		132 KV Shahibagh	5	2	3
		132 KV Sakhi Chashma	2	-	-
		132 KV Pesh: University	3	-	-
		66 KV Warsak	2	-	-
		132KV Mattani	3	-	-
		132 KV Pabbi	2	-	-
		132 KV Rehman Baba	1	-	-
	Sub Total		36	5	3
	District Charsadda	132KV Charsadda	2	1	1
		132 KV Shabqadar	4	-	-
		132 KV Tangi	2	1	1
	Sub Total		8	2	2
	District Hangu	66 KV Hangu	2	-	-
	District Kohat	66 KV Kohat	2	-	-
		132 KV Kohat	4	1	1
		132KV Gumbat	1	-	-
		132 KV Lachi	1	-	-
	Sub Total		8	1	1
	Grand Total		52	8	6

2. Sampling and Analysis Schedule for PCBs at SS&TL Division, PESCO Bannu

No	Name of District	Location	Total Nos of Transformers	Nos of Oil sample required	Nos of soil sample required
	District Bannu	132 KV Bannu	4	1	1
		66 KV Bandkurai	2	-	-
		Private repair workshop	-	1	1
	Sub Total		6	2	2
	District DIKhan	132KV DIKhan	3	-	-
		66 KV Draban	1	-	-
	Sub Total		4	-	-
	District Karak	132 KV Gurguri	1	-	-
		132 KV Karak	2	1	-
	Sub Total		3	1	-
	District Lakki	66 KV Klilachi	1	-	-
		66 KV Pezu	1	-	-
		66 KV S/Naurang	1	1	-
		132 KV Prova	1	-	-
		66 KV Tajazai	2	-	-
	Sub Total		6	1	-
	District Tank	132 KV Tank	4	-	-
		66 KV Tank	1	-	-
	Sub Total		5	-	-
	GRAND TOTAL		24	4	2

3. Sampling and Analysis Schedule for PCBs at SS&TL Division, PESCO Mardan

S. No	Name of District	Location	Total Nos of Transformers	Nos of Oil sample required	Nos of soil sample required
	District Swat	132 KV Swat	4	2	1
		132 KV Khwaza Khela	1	-	-
	Sub Total		5	2	1
	District Lover Dir	132 KV Chakdara	3	1	1
		132 KV Timergara	2	-	-
		66 KV Timergara	2	-	-
		132 KV Madyan	1	-	-
	Sub Total		8	1	1
	Dist: Nowshera	132 KV Nowshera City	3	1	-
		132.KV Jehangira	2	-	-
		132 KV Nowshera Indl	2	-	-
		132 KV Nizampur	1	-	-
		166 KV Kheshki	1	-	-
	Sub Total		9	1	-
	District Swabi	132KV Swabi	2	-	-
		132KV G/Amazai	2	-	-
		132 KV R.B. Tarbela	2	1	-
	Sub Total		6	1	-
	Dist:	132 KV Jalala	2	1	1

	Mardan				
		132 KV Mardan-2	2	-	-
		66 KV Jalala	1	-	-
		66 KV Mardan	1	-	-
		66 KV Hussai	2	-	-
	Sub Total		8	1	1
	District Bunir	66 KV Daggar	2	-	-
	District Upper Dir	66 KV Dir	2	-	-
		66 KV Warai	1	-	-
	Sub Total		3	-	-
	District Chitral	33 KV Jutilasht (Chitral)	1	-	-
		33 KV Dorsh (Chitral)	1	-	-
	Sub Total		2	-	-
	Grand Total		43	6	3

**4. Sampling and Analysis Schedule for PCBs at SS&TL Division, PESCO
Abbottabad**

No	Name of District	Location	Total Nos of Transformers	Nos of Oil sample required	Nos of soil sample required
	District Abbottabad	132KV Abbottabad	2	1	-
		132 KV AMC A/Abad	1	-	-
		132 KV Nathia Gali	1	-	-
		66 KV Abbottabad	2	-	-
		66 KV Havelian	2	-	-

	Sub Total		8	1	-
	District Manshra	132 KV Battal	2	-	-
		132 KV Balakot	2	-	-
		132 KV Manshra	2	1	-
	Sub Total		6	1	-
	District HariPur	132 KV Haripur	2	1	-
		132 k V Hattar	2	-	-
		132 KV Nishat Tarbela	2	-	-
		66 KV Haripur	2	-	-
	Sub Total		8	1	-
	District Batta Gram	33 KV Thakot	2	-	-
	Grand Total		24	3	-

Total Number of Oil and Soil Analyzed District Wise

S.No.	Name of District	Location	Number of Oil Samples			Number of Soil Samples		
			Power	Grid	Distribution	Power	Grid	Distribution
1.	Peshawar	Peshawar SB/ City/Fort/HA		5			3	
2.		Warsak	4			2		
3.	Charsadda	Charsadda		1			1	
4.		Tangi		1			1	
5.	Kohat	Kohat		1			1	
6.	Bannu	Bannu		1	1		1	1
7.	Karak	Karak		1				
8.	Lakki	S/Naurang		1				
9.	Swat	Swat		2			1	
10.	L. Dir	Chakdara		1			1	
11.	Nowshehra	City		1				
12.		Reclamation Workshop			19			4
13.	Swabi	R.B.Tarbela		1				
14.		Tarbela	7					
15.	HariPur	132 KV Haripur		1				
16.	Abbottabad			1				
17.	Mansehra	132 KV Manshera		1				
18.	Mardan	Jalala		1			1	
TOTAL			11	20	20	2	10	5

Annex-I
Photographic record of Transformers Reclamation Workshop Nowshehra



Photographic record of Transformers Reclamation Workshop Nowshehra (continued)



Balochistan

PCBs

The growing emphasis is on the development of Engineering, Electrical, and Non-electrical Machinery, Automobiles and Chemical Industries. Increasing proportion of investment flowing into these sectors has significantly diversified the industrial structure in recent years. The electronics Passive components manufacturing in Pakistan are limited to:

- i) Capacitors (aluminum, ceramic, film, tantalum, variable and pre-set capacitors)
- ii) Inductors (chokes, coils, cores, electro-magnetic interference (EMI filters, magnets)
- iii) Resistors (carbon, metal, wire wound, variable resistors, ntc/ptc thermistors, potentiometers, resistor networks, rheostats)
- iv) Transformers (line, power)

WAPDA, the Pakistan Water and Power Development Authority, was created in 1958 as a Semi-Autonomous Body for the purpose of coordinating and giving a unified direction to the development of schemes in Water and Power Sectors, which were previously being dealt with, by the respective Electricity and Irrigation Department of the Provinces.

The Charter of Duties of WAPDA is to investigate, plan and execute schemes for the following fields:

Generation, Transmission and Distribution of Power.

Irrigation, Water Supply and Drainage.

Prevention of Water logging and Reclamation of Waterlogged and Saline Lands.

Flood Management.

Inland Navigation.

Power Wing is currently headed by Member (Power). Power wing of WAPDA comprising of Generation, Transmission and Distribution has been restructured into fourteen (14) public limited companies. These fourteen (14) Corporate Entities are;

a) Four (4) Thermal Power Generation Companies (GENCOs)

1. Southern Generation Power Company Limited (GENCO-1) head quarter at Jamshoro district Dadu near Hyderabad Sindh.
2. Central Power Generation Company Limited (GENCO-2) head quarter at Guddu district Jacobabad Sindh.
3. Northern Power Generation Company Limited (GENCO-3) head quarters at TPS Muzaffargarh district Muzaffargarh Punjab.
4. Lakhra Power Generation Company Limited (GENCO-3)

Headquarter at WAPDA House Lahore.

b) One (1) National Transmission & Power Dispatch Company

c) Nine (9) Distribution Companies (DISCOs) as under:

1. [LESCO](#) - Lahore Electric Supply Company
2. [GEPCO](#) - Gujranwala Electric Power Company
3. [FESCO](#) - Faisalabad Electric Supply Company
4. [IESCO](#) - Islamabad Electric Supply Company
5. [MEPCO](#) - Multan Electric Power Company
6. [PESCO](#) - Peshawar Electric Power Company
7. [HESCO](#) - Hyderabad Electric Supply Company
8. [QESCO](#) - Quetta Electric Supply Company
9. [TESCO](#) - Tribal Electric Supply Company

Sources of Power Supply

- I National Grid**
- II Mekran Regional Grid**
- III Local Generation Small Power Houses**
- IV IPPS**

- (1) Habibullah Coastal Power = 140 MW (Quetta)
- (2) Uch Power - D.M. Jamali = 586 MW
- (3) Hub Power Company =1290 MW

- 1 Status of 132 KV in-service / out of service capacitors
Annexure-A
- 2 Status of installed in-service / out of service 11KV capacitors
Annexure-B
- 3 Power transformers GSO Circle QESCO, Quetta Annexure-
C
- 4 Transformers installed QESCO Annexure-D
- 5 No of Grid Stations and its location Annexure-E
- 6 No. of 33 KV Grid Stations with capacity of Power
Transformer Annexure-F.

STATUS OF 132 KV INSERVICE/ OUT OF SERVICE CAPACITORS (QESCO)

S.No	Name of 132kv Grid Station	Capacity Installed & in Circuit	Enhancement Proposed in Existing Racks
1.	Qilla Abdullah	36 mvar	-
2.	Mangocher	36 mvar	12 mvar (30 No. cell of 400 kvar)
3.	Surab	24 mvar	48 mvar (12 No. cells of 400 kvar)

TRANSFORMERS INSTALLED - QESCO

Name of Distribution Transformers	23851
10 KVA	03
15 KVA	07
25 KVA	9294
50 KVA	10212
75 KVA	16
100 KVA	3499
200 KVA	699
250 KVA	01
400 KVA	36
450 KVA	02
630 KVA	53
Others	29

For Official Use Only (Not for Distribution)



POPs Enabling Activity Project

Government of Pakistan
Ministry of Environment
Islamabad



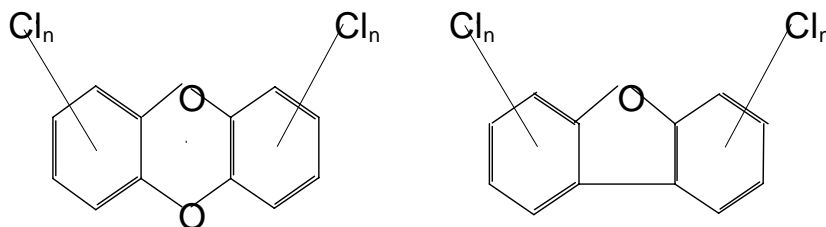
ANNEXURES (VOL II)
Inventories
NATIONAL IMPLEMENTATION PLAN (NIP)
FOR
PHASING OUT AND ELIMINATION OF
POPS FROM PAKISTAN
UNDER STOCKHOLM CONVENTION
ARTICLE 7 (a)

NWFP

COMPOSITION OF DIOXIN AND FURANS

Dioxin is a chemical name with multiple uses. In less careful language dioxin is used as a synonym of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), or any of the polychlorinated dibenzo-p-dioxins (PCDD) or dibenzofurans (PCDF), or the whole class of these compounds (see below). In strict chemical sense dioxin is a heterocyclic ring-structured chemical containing carbon, oxygen and hydrogen, $C_4H_4O_2$, forming e.g. the middle ring of dibenzo-p-dioxin (see below)

Polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzo-p-furans (PCDFs) are two series of compounds with 210 congeners sharing similar physicochemical and biological properties.



- A. Polychlorinated dibenzo-p-dioxins (PCDDs).
- B. polychlorinated dibenzo-p-furans (PCDFs), $n=1-4$.

Table-1: **Detail of Asphalt Mixing Plant owned by Frontier Highway Authority (FHA)**

Sr. No.	Location	Manufacturer	Per Day Capacity	Average Annual Operation	Annual Capacity
1.	Kandi Tazadin, Near Khyber Lamps, Pabbi, Nowshera	Parker, USA	280 t/d	6 – 9 moths (average 225 days)	63000 t/a
2.	Mingora, Swat	Nigatta, Japan	245 t/d	6 – 9 moths	55125 t/a

				(average 225 days)	
3.	Havilian, Abbottabad	Nigatta, Japan	245 t/d	6 – 9 moths (average 225 days)	55125 t/a
4.	Buner	Parker, USA	280 t/d	6 – 9 moths (average 225 days)	63000 t/a
5.	Chitral	HMC, Pakistan	210 t/d	6 – 9 moths (average 225 days)	47250 t/a
Total			1260 t/d	(average 225 days)	283500 t/a

Table-2: Detail of Asphalt Mixing Plant in Private Sector

Sr. No.	Owner & Location	Per Day Capacity	Average Operation	Annual	Annual Capacity
1.	NIC, Near Naguman Chowk, Charsadda Road, Peshawar	280 t/d	6 – 9 moths (average 225 days)		63000 t/a
2.	PMC, Bara Banda, Nowshera	280 t/d	6 – 9 moths (average 225 days)		63000 t/a
3.	SKB, Nahakey, Charsadda Road, Peshawar	245 t/d	6 – 9 moths (average 225 days)		55125 t/a
4.	Link Road, Bannu	280 t/d	6 – 9 moths (average 225 days)		63000 t/a
5.	Chakdara	245 t/d	6 – 9 moths (average 225 days)		55125 t/a
6.	Mohmand Premix Asphalt Plant, Sakhakot, Dargai	210 t/d	6 – 9 moths (average 225 days)		47250 t/a
Total		1540	(average 225 days)		346500 t/a

TRANSPORT

According to the development statistics of NWFP 2003, the total number of vehicles registered with Excise and Taxation department in different districts is 351100. Out of which 68455 are having 4 stroke petrol engines, 95766 having 2 stroke petrol engines and the remaining 186879 are diesel fed engine vehicles. As the sector is very much complicated and a separate study is needed to calculate the actual quantity of fuel consumed by each category of vehicle. For the calculation of dioxin and furans emissions from transport sector in NWFP the following assumptions were made to furnish inventory. The table below shows the assumed quantity of annual fuel consumption on average basis for each category of vehicle:

Category of Vehicles	Assumptions		
	km/day	km/liter	Liter/Annum
Buses / Mini Buses	300	5	21600
Delivery Van / Pickups	300	8	13500
Motor Cabs (Taxi)	300	10	10800
Motor Cabs (Rickshaws)	250	20	4500
Motor Car/Jeep/Station Wagon	300	12	9000
Motor Cycle/Scooter	50	20	900
Other Vehicle	250	10	9000
Private Carrier Trucks	300	5	21600
Public Carrier Trucks	250	5	18000
Tractors	200	4	18000

Annex-A: Industrial Estates of NWFP

1. Industrial Estate Peshawar

Location	Jamrud Road, Peshawar
Total Area	868 Acres
Total No. of Plots	360
Total No. of Plots Allotted	360
Total No. of Units in Operations	160
No. of Units Closed	61
Total No. of Units Under Construction	61

2. Industrial Estate, Hattar

Location	Near Kot Najibullah, Haripur – Taxila Road, Haripur District
Total Area	1063 Acres
Total No. of Plots	356
Total No. of Plots Allotted	356
Total No. of Units in Operations	91
No. of Units Closed	100
Total No. of Units Under Construction	33

3. Industrial Estates Gadoon Amazai

Location	Swabi-Topi Road, Tehsil & District Swabi
Total Area	1116 Acres
Total No. of Plots	623
Total No. of Plots Allotted	455
Total No. of Units in Operations	52
No. of Units Closed	160
Total No. of Units Under Construction	0

Annex-B: Small Industrial Estates, NWFP

1: Small Industrial Estate, Peshawar

Name	SIE, Peshawar
Location	Kohat Road, (Ring Road), Peshawar
Total Area	51.14 Acres
Total No. of Plots	292
Total No. of Plots Allotted	292
Total No. of Units in Operations	53
No. of Units Closed	19
Total No. of Units Under Construction	0

2: Small Industrial Estate, Peshawar

Name	SIE, Jamrud Road, Peshawar
Location	Jamrud Road, Hayatabad, Peshawar
Total Area	50 Acres
Total No. of Plots	168
Total No. of Plots Allotted	168
Total No. of Units in Operations	7
No. of Units Closed	5
Total No. of Units Under Construction	0

3: Small Industrial Estate, Mardan

Name	SIE, Mardan
Location	Mardan – Nowshera Road
Total Area	60 Acres

Total No. of Plots	338
Total No. of Plots Allotted	338
Total No. of Units in Operations	36
No. of Units Closed	17
Total No. of Units Under Construction	0

4: Small Industrial Estate, Haripur

Name	SIE, Khalabat
Location	Khalabat Township, Haripur
Total Area	20 Acres
Total No. of Plots	99
Total No. of Plots Allotted	96
Total No. of Units in Operations	1
No. of Units Closed	10
Total No. of Units Under Construction	0

5: Small Industrial Estate, Abbottabad

Name	SIE, Abbottabad
Location	Manshera Road, Abbottabad
Total Area	20 Acres
Total No. of Plots	109
Total No. of Plots Allotted	116
Total No. of Units in Operations	12
No. of Units Closed	13
Total No. of Units Under Construction	0

6: Small Industrial Estate, Manshera

Name	SIE, Manshera
Location	Shehilia Road, Manshera
Total Area	20 Acres
Total No. of Plots	112
Total No. of Plots Allotted	107
Total No. of Units in Operations	11
No. of Units Closed	6
Total No. of Units Under Construction	15

7: Small Industrial Estate, Kohat

Name	SIE, Kohat
Location	Dhoda Road, Kohat
Total Area	50.33 Acres
Total No. of Plots	148
Total No. of Plots Allotted	58
Total No. of Units in Operations	1
No. of Units Closed	4
Total No. of Units Under Construction	0

8: Small Industrial Estate, D.I.Khan

Name	SIE, DIKhan
Location	Tank Road, DIKhan
Total Area	29.5 Acres
Total No. of Plots	141
Total No. of Plots Allotted	127
Total No. of Units in Operations	6
No. of Units Closed	11
Total No. of Units Under Construction	0

9: Small Industrial Estate, Bannu

Name	SIE, Bannu
Location	Bannu - Kohat Road, Bannu
Total Area	59.3 Acres
Total No. of Plots	242
Total No. of Plots Allotted	84
Total No. of Units in Operations	8
No. of Units Closed	13
Total No. of Units Under Construction	4

10: Small Industrial Estate, Charsadda

Name	SIE, Charsadda
Location	Takht Bhai – Rajjar Road, Charsadda
Total Area	30 Acres
Total No. of Plots	139
Total No. of Plots Allotted	
Total No. of Units in Operations	
No. of Units Closed	
Total No. of Units Under Construction	

Annex-C: Special Industrial Zone, NWFP

Name	Special Industrial Zone, Risalpur
Location	Nowshera – Mardan Road, Near Locomotive Factory, Risalpur
Total Area	108 Acres
Total No. of Plots	80
Total No. of Plots Allotted	66
Total No. of Units in Operations	10
No. of Units Closed	3
Total No. of Units Under Construction	3

Annex-D: Export Processing Zone of NWFP

Name	Export Processing Zone, Risalpur
Location	Mardan Road, Near Locomotive Factory, Risalpur, Nowshera.
Total Area	92 Acres
Total No. of Plots	137
Total No. of Plots Allotted	4
Total No. of Units in Operations	
No. of Units Closed	
Total No. of Units Under Construction	

Annex-E: Details of Hospital Waste Incinerators installed in NWFP

Details of Incinerators Installed in Different Hospitals of NWFP

S. No.	Name of Hospital (where incinerator is installed)	Contact Person Detail	Capacity/per hour	Working Temperature	Fuel	Type of Waste incinerator	Daily Average Waste Incineration	Daily burning time	Working/ burning days per week	Disposal of Ashes/Incinerator Waste	Remarks
1.	Lady Reading Hospital, Peshawar	Dr. Mukhtiar DMS 0333-9133245 Engr. Sujaat Ali Khan 0300-5920061	50-150kg	800°C - 1000°C	Dual (diesel + Natural Gas) in Practice	Plastic, Syring, OT Waste, Blood Bags, having positive reports of incinerable diseases + body parts	180-200 kg*	5-6 hours	6 days	Packed in plastic bags and dumped in Municipal bins.	Dioxins
2.	Khyber Teaching Hospital, Peshawar	Ajmal Saeed, Maintenance Engineer 091-9216340-47 ext-2007	50-150 kg	900°C - 1000°C	- do -	Syng, cotton, OT Waste	Not known	30 – 60 minute	3 days	- do -	Dioxins
3.	Hayatabad Medical Complex, Peshawar	Dr. Salar DMS Khalid Khan (Engineer) Shehzad (Supervisor) 091-9217140	50-150 kg	900°C - 1000°C	- do -	Drips, syring, OT Waste, Cotton	50 – 100 kg	2–3 hours	6 days	Buried in the soil in side the boundary wall of hospital	Dioxins
4	Ayub Medical College, Abbottabad	Syed Zulfiqar Shah 0992-381907-14 Ext 3308	50-150 kg	800°C - 1000°C	- do -	Drips, syring, OT Waste, Cotton	20 – 30 kg	2 hours	6 days	Municipal Waste	Dioxins

Annex-F: List of Running Industrial Units in NWFP

TARGET INDUSTRIES FOR DIXIONS AND FURANS IN NWFP (RUNNING UNITS)

1. List of Paper and Paper Board Industries in NWFP

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
1.	Olympia Paper and Board Mills (Pvt) Ltd	I.E. Jamrud Road, Peshawar	1992	Paper/Paper Board	7500 T.PA
2.	Sarhad Board and Chemical (Pvt) Ltd.	I.E. Jamrud Road, Peshawar	1995	Paper/Paper Board	3000 T.PA
3.	Flying Craft Industries (Pvt) Ltd.	District Charsadda	1992	Craft Paper	40000 T. PA
4.	Paper World International (Pvt) Ltd.	Amangarh, Nowshera	1991	Paper/Paper Board	6000 T. PA 25500 T.PA
5.	Neelam Paper Mills (Pvt) Ltd.	I.E.Hattar, Haripur	1992	Packing Paper	3000 T.PA
6.	Paramount Paper Mills (Pvt) Ltd	I.E. Hattar, Haripur	1994	Fluiting Paper	6000 T.PA

2. List of Polymer, Plastic and Rubber Industries in NWFP

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
1.	Swat Tyre Retread Pvt Ltd	IE Jamruad Road, Peshawar	1988	Tyre & Retread	.054 M. No. PA
2.	Aawan Rubber Works Ltd	SIE Kohat Road, Peshawar	1988	Rubber Bush	9000 Dozens PA
3.	M. Shereen & A. Aziz Plastic Ind	GT Road, Peshawar	1990	Chappal & Boots	.024 M. Dozen Pair PA
4.	Moon Star Plastic Industry	SIE Kohat Road, Peshawar	1990	Recycling of Plastic Waste	10 T. daily
5.	Saleem Water Tank Industry	SIE Kohat Road, Peshawar	2002	Water Tank	100 Nos Daily
6.	Twin Star Industry Ltd	IE Jamruad Road, Peshawar	1990	Printed Plastic	60 T.PA
7.	United Rubber Ltd	IE Jamruad Road, Peshawar	1992	Tyre/Tube	0.120/ 0.180 M.PA
8.	Delta Eng. Industry Ltd	Peshawar	1999	Plastic Rope	400 kg Daily
9.	Ali Plastic Industry	SIE Jamruad Road, Peshawar	2002	Shoes / Chappal	30 Dozen Daily
10.	Ittefaq PVC Industry	Pakha Ghulam, Dalazak Road, Peshawar	1994	PVC Pipe	0.420 M. Rft PA
11.	MKB Enterprises Pvt Ltd	IE Jamruad Road, Peshawar	1994	Plastic PP Woven Mades	0.320 M. Pes PA
12.	Ropeman Industry Pvt Ltd	IE Jamruad Road, Peshawar	1995	Plastic Rope	255 T. PA
13.	Prime Star Industry Pvt Ltd	IE Jamruad Road, Peshawar	1995	PVC House Pipe and PP Sheets	8244 T. PA
14.	Royal PVC Pvt ltd	IE Jamruad Road, Peshawar	1997	PVC Pipe	0.900 M. T. PA
15.	Madina PVC Pipe	Pakha Ghulam, Peshawar	1997	PVC Pipe	560000 RFT. PA
16.	Khyber Plastic and Rubber Company	IE Jamruad Road, Peshawar	1998	Plastic Rope	430 T. PA
17.	Unicon Rubber Products	IE Jamruad Road, Peshawar	2001	Rubber Plastic Products	1500000 KG PA
18.	Khyber Rubber	IE Jamruad Road, Peshawar	1991	Tyre Retreading	48000 T. PA
19.	Chand Industries	SIE Jamruad Road, Peshawar	1993	Plastic Rope	200 kg Daily

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
20.	Pak PVC Industry	SIE Kohat Road, Peshawar	2001	PVC Pipe	700 kg Monthly
21.	Shaheen Plastic	SIE Kohat Road, Peshawar	2001	PVC Pipe	800 kg Monthly
22.	Seven up Plastic	SIE Kohat Road, Peshawar	2001	Chappal/Shoes	50 Dozen Daily
23.	Polytech PVC Pipe Ind	GT Road, Taru Jabba,	1995	PVC Pipe	240 T. PA
24.	Saeed Plastic	Rustam, Mardan	1990	Plastic Footwear	0.172 Mln. Pairs PA
25.	Sunrise Plastic Ind	Rustam, Mardan	1995	Plastic Footwear	0.0900 Mln. Pairs d/n PA
26.	Pride Plastic Ind	SIE, Mardan	1999	Plastic Bottle & Jars	300 T. PA
27.	Turbela Ind. Ltd	Gadoon Amazai, Swabi	1990	Footwear & Garden Pipe	4100 T. PA
28.	MKB Ind Ltd	Gadoon Amazai, Swabi	1991	Shopping Bags	1950 T. PA
29.	Top Star Ind	Gadoon Amazai, Swabi	1991	Shopping Bags	1800 T. PA
30.	Sunrise Polyester Pvt Ltd	Gadoon Amazai, Swabi	1991	Metalic 'yarn & Sheets, Plastic Ribbon	1300 T. PA 3000 T. PA
31.	Crescent Ind Ltd	Gadoon Amazai, Swabi	1991	Shopping Bags	600 T. PA
32.	Kashmir Polytex Ltd	Gadoon Amazai, Swabi	1992	P.P. Woven Bags	15 Mln. T.PA
33.	Sheraz Plastic Ind Ltd	Gadoon Amazai, Swabi	1992	Shopping Bag & Rolles	2600 T. PA 720 T. PA
34.	Margala Packages & Allied Ind	Gadoon Amazai, Swabi	1992	P.P. Woven Bags	600 T. PA
35.	Syntron Pvt Ltd	Gadoon Amazai, Swabi	1992	P.P. Woven Bags	4578 T. PA
36.	Alpha Vinyl Ind Pvt Ltd	Gadoon Amazai, Swabi	1993	PVC Pipe	3000 T. PA
37.	SAB Polymer Ind Pvt Ltd	Gadoon Amazai, Swabi	1993	Infusion Sets	5 Mln Nos PA
38.	Taj Syringes Pvt Ltd	Gadoon Amazai, Swabi	1994	Disposable Syringes	60 Mln. Nos PA
39.	Convertors Pvt Ltd	Gadoon Amazai, Swabi	1994	Packaging Flexible Material	12000 T. PA
40.	Allied International Ind	Gadoon Amazai, Swabi	1990	Reclain Rubber	1080 T. PA

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
	Pvt Ltd				
41.	Jehanzeb Plastic Industry	Vil: Latifi Sakhakot, Malakand Agency	1999	PVC Shoes	.018 Mln. Dzn Pair PA
42.	Raees Plastic Industry	Vil: Latifi Sakhakot, Malakand Agency	1999	PVC Shoes	.018 Mln. Dzn Pair PA
43.	A-One Plastic Works	Diwana Baba, Bunir	1987	PVC Shoes	8925 Dzen Pairs PA
44.	Qismat Plastic Industry	Malakand Mingora Swat	1982	PVC Shoes	.025 Mln Dozen PA
45.	National Plastic Industry	GT Road Rahimabad, Swat	1985	Water Cooler, Hot Pot, Basket/Tubes	0.030 Mln. Nos PA 0.100 Mln. Nos PA 0.850 Mln. Nos PA
46.	Rasool Mohammad Plastic Industry	Pnar Mingora, Swat	1988	PVC Shoes	0.030 Dozen PA
47.	Khwezak Plastic Industry	Barikot Swat	1989	PVC Shoes	0.025 Dozen PA
48.	Al-Qasim Plastic Industry	Bunir Road, Mingora Swat	1991	Polythene Bags	240 T.PA
49.	Shamuel Plastic Industry	Takhta Band Road, Mingora Swat	1991	Basket Tray/ Buckets	0.425 Mln. Nos PA 1.800 Mln. Nos PA
50.	Tahir Plastic Industry	GT Road Balogram Swat	1992	Basket/Mugs / Jars Jug & Trays	0.350 Mln. Nos PA 0.350 Mln. Nos PA 0.900 Mln. Nos PA
51.	Mohammad Shah Khan Plastic Industry	Faizabad, Mingora Swat	1994	PVC Shoes	0.020 Mln. Nos PA
52.	Ittehad Plastic Industry	Muslimabad Aligrama Swat	1994	Basket/Mugs / Jars Jug & Trays	0.300 Mln. Nos PA 0.800 Mln. Nos PA
53.	Riaz Plastic	GT Road Manyar Swat	1994	Household Plastic	0.900 Mln. Nos

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
	Industry			Utensils	PA
54.	Adnan Plastic Industry	Pnar Mingora, Swat	1995	PVC Shoes	0.030 Mln. Nos PA
55.	Diamond Plastic Industry	Usmanabad, Mingora	1996	PVC Shoes	0.010 Mln. Nos PA
56.	Amin Plastic Industry	GT Road, Rahimabad, Swat	1999	PVC Shoes	0.800 Mln. Nos PA
57.	K-2 Plastic Industry	Pnar, Mingora Swat	1992	PVC Shoes	0.600 Mln. Nos PA
58.	Pak Plastic Industry	Pnar, Mingora Swat	1998	PVC Shoes	0.025 Mln. Nos PA
59.	Sahib Plastic Industry	Pnar, Mingora Swat	1998	PVC Shoes	0.096 Mln. Nos PA
60.	Nawab Plastic Industry	Pnar, Mingora Swat	1998	PVC Shoes	0.035 Mln. Nos PA
61.	New Swat Pipe Factory	Rahimabad, Swat	194	Pipe PVC	0.250 Mln. Nos PA
62.	Hayat PVC Pipe Industry	Bunir Road, Barikot Swat	1996	Pipe PVC	120 Mln. Nos PA
63.	Allied Rubber Pvt Ltd	Takhta Band Road, Mingora	1998	Tyres Tubes	0.600 Mln. Nos PA 0.600 Mln. Nos PA
64.	Hayat PVC Pipe Factory	SIE Bannu	1995	PVC Pipe	0.369 Mln. Nos PA
65.	Bannu Shoes	Outside Kacheri Gate, Bannu	1999	Shoes	0.012 Mln. Nos PA
66.	Mian Plastic	DIKhan Road, Bannu	1997	Utensils	300 T. PA
67.	Indus Plastic Ind. Pvt Ltd	University Road, DIKhan	1995	PVC Pipe	120 T. PA
68.	Plasco Pack Pvt Ltd	IE Hattar, Haripur	1989	Plastic Packing Crates	0.360 Mln. Units PA
69.	Taxac Rubber Ind Pvt Ltd	IE Hattar, Haripur	1992	Rubber Rings	6.000 Mln. Pes. PA
70.	Sarina Ind Pvt Ltd	IE Hattar, Haripur	1993	PVC Pipes	2000 T. PA
71.	Plastobag Ltd	IE Hattar, Haripur	1993	Plastic Bottles	2850 T. PA
72.	Tripack Films Ltd	IE Hattar, Haripur	1995	Poly Propylene Films	7500 T. PA
73.	Nova	IE Hattar,	1998	Poly	900 T. PA

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
	Synpak Ind Pvt Ltd	Haripur		Propylene Bags	

3 List of Steel Foundries/ Re-Rolling / Fabrication Industries in NWFP

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
	Frontier Ind. Ltd	Gulbahar, Peshawar	1955	Ingots	9000 T.PA
	Folad Ltd	IE Jamrud Road, Peshawar	1983	Steel Fabrication	2000 T. PA
	Khurram Steel Casting Ltd	IE Jamrud Road, Peshawar	1983	Foundry	1800 T. PA
	Lahore Steel Pvt Ltd	IE Jamrud Road, Peshawar	1991	MS Bars	7500 T.PA
	MYKA Steel Pvt Ltd	IE Jamrud Road, Peshawar	1993	MS Bars	0.010 Mln T.PA
	Jalala Ind	IE Jamrud Road, Peshawar	1988	Steel Fabriation	200 T..PA
	Royal Fitter Ind	IE Jamrud Road, Peshawar	2001	Auto Fitter	2 Mln. PA
	Technicon Pvt Ltd	IE Jamrud Road, Peshawar	2000	Terbines	200 PA
	Al-Rahim Engg	IE Jamrud Road, Peshawar	1996	Steel Fabrication	2000 T.PA
	Peshawar Pipe Mills Ind	IE Jamrud Road, Peshawar	1996	GI Pipe	400 Mln Pipes PA
	Alpha Engineering Ind	SIE Kohat Road, Peshawar	1995	Machinery Repair	200 T.PA
	Al-Raza Engineering	SIE Kohat Road, Peshawar	1988	Machinery Repair	200 T.PA
	Gandaf Steel Mills Ltd	Gadoon Amazai, Swabi	1991	Steel Ingots	0.025 Mln. T.P.A
	Effendi Steel Mills Ltd	Gadoon Amazai, Swabi	1992	Steel Ingots	0.006 Mln. T.P.A
	Frontier Steel Mills Ltd	Gadoon Amazai, Swabi	1992	Steel Ingots	0.015 Mln. T.P.A
	United Engineering	IE Jamrud Road, Peshawar	2001	MS Pipes	3000 sq. ft PA
	Pakistan Locomotive	Mardan Road, Nowshera	1993	Locomotive Diesel Engine	25 Nos. PA

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
	Factory				
18.	National Steel Rolling Mills Ltd	IE Hattar, Haripur	1989	MS Bars	3000 T.PA
19.	Neelum Steel Ind	IE Hattar, Haripur	1992	MS Bars	0.010 Mln. T.PA
20.	Nomee Steel Re-Rolling Mills	IE Hattar, Haripur	1993	MS Bars	0.010 Mln. T.PA
21.	Silichem Ind. Ltd	IE Hattar, Haripur	1994	MS Bars	9000 T.PA
22.	Hattar Steel Re-Rolling Mills	IE Hattar, Haripur	1999	MS Bars	0.012 Mln. T.PA
23.	Victor Gas Tanoor	SIE Kohat Road, Peshawar	2000	Gas Tanoor	100 Nos PM
24.	Nauman Engg ind	IE, Jamruad Road, Peshawar	1988	S/Fabrication	5000 Nos. PA
25.	Shan Gas Tanoor	SIE Kohat Road, Peshawar	2000	Gas Tanoor	100 Nos. PM
26.	Daud Sons Ind	SIE Kohat Road, Peshawar	1993	Bomb Bodies	3000 Nos .PA
27.	Wali Engg	IE, Jamruad Road, Peshawar	1994	Tractor/Assembling	500 Nos. PA
28.	New Awan Ind	SIE Kohat Road, Peshawar	1994	Wood Crew/Nail	0.240 Mln. Pkt PA
29.	Pakistan Hitech Engg	GT Road, Peshawar	1997	Engg. Works	50 T.PA
30.	Alsar Malik Metal Works	Vil: Badrashi, Nowshera	1996	Oil Filter	.360 Mln. Nos PA
31.	Integra Automotive LTd	Gadoon Amazai	1992	Radiator	41.000 Mln. Nos. PA
32.	Diamond Weld Rods Pvt LTd	IE Hattar, Haripur	1996	Weld Rods	0.02 Mln. Nos. PA
33.	Arif & Co Pvt LTd	SIE Abbottabad	1988	Steel Water Tanks	3000 Nos. PA
34.	Tipu enterprises Pvt LTd	SIE Abbottabad	1990	Hose Clamps/Pipes	2.700 Mln. Nos. PA
35.	Kamran Steel	SIE Abbottabad	1994	Steel Box/Buckets Etc	3800 Nos . PA
36.	Allaudin Engg	SIE Abbottabad	1995	Vehicle Overhauling	200 Nos PA
37.	Sardar Enterprises	SIE Abbottabad	1990	Steel Furniture Grills	0.010 Mln. Nos. PA
38.	Rehman Aluminum Ind	SIE Kohat Road, Peshawar	1985	Aluminum Utensils	500 T.PA

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
	Al-Arabia Industries	SIE Kohat Road, Peshawar	1985	Aluminum Utensils	1200 T.PA
	Sana Aluminum	IE Jamruad Road, Peshawar	1986	Door	400 T.PA
	Al-Amin PVt LTd	SIE Kohat Road, Peshawar	1973	Aluminum Utensils	300 T.PA
	Adil Aluminum Ind	SIE Mardan	1987	Aluminum	200 T.PA
	Bunir Aluminum	Mardan Road, Sawari, Bunir	1998	Aluminum Steel	30 T.PA
	Shadman Metal Fabricators Pvt Ltd	Amangarh, Nowshera	1993	Tin Container	6000 Nos of 16 kg PA 8000 Nos of 5 kg PA 8000 Nos of 2.5 kg PA

4. List of (Lubricants/Petroleum Industries) Power sector and Refineries Units in NWFP

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
1.	Salman Shahid Oil Company	GT Road, Peshawar	1998	Lubricants Oil and Greases	9.605 Mln. Ltr. P.A. 1000 T. P.A.

5. List of Cement Kilns/Industries in NWFP

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
1.	Cherat Cement Company Ltd	Cherat, Nowshera	1985	Cement	2200 T.P day
2.	Army Welfare Trust Cement Plant	Nowshera	1996	Cement	2000 T. P day
3.	Kohat Cement Company	Pindi Road, Kohat	1983	Cement	1800 T.P day
4.	Lucky Cement Factory	Pezue, Lakki Marwat	1996	Cement	4000 T. P day

5.	Bestway Cement Ltd	Shadi, Hattar Haripur	1998	Cement	3300 T. P day
6.	Saadi Cement	Hattar, Haripur	2002	Cement	3600 T. P day

6. List of Glass, Ceramics & Tiles Industries in NWFP

Sr. No.	Name of Industry	Location/Address	Year of Establishment	Product	Production Capacity
1.	Frontier Ceramics Industries	IE Jamrud Road, Peshawar	1986	World Tiles, Sanitary Wear	0.500 Mln, Sq. Mtr PA 3000 T. PA
2.	Peshawar Ceramics Pvt Ltd	IE Jamrud Road, Peshawar	1995	Ceramics, Sanitary Wear	0.09 Mln Pcs PA
3.	Swat Ceramics Company Pvt Ltd	GT Road, Saidu, Nowshera	1977	World Tiles	0.360 Mln, sq. mtr PA
4.	Swat China Clay	Shah Deri, Swat	1974	China clay	4800 T. PA
5.	Durrani ceramics Pvt Ltd	IE, Hattar, Haripur	1995	Refractories Items	3.800 T. PA
6.	Omar Glass Ind Ltd	IE Jamrud Road, Peshawar	1977	Glass	1350 T. PA
7.	Rocksun Glass	IE Jamrud Road, Peshawar	2000	Glass Products Dinner Set	45 mln T. PA
8.	Nowshera Sheet Glass Ind	GT Road, Saidu, Nowshera	1982	Sheet Glass, Tough Glass	1200 T. PA 0.100 Mln. Sq Mtr PA
9.	Ghani Glass Ind Ltd	Shadi, Hattar, Haripur	1995	Glass bottle	0.022 Mln. T. PA
10.	Murree Glass Ind	IE Hattar, Haripur	1995	Glass bottle	0.024 Mln. T.PA
11.	Crystal Pvt Ltd	IE Hattar, Haripur	1999	Glass wear	0.055 Mln. Nos. PA
12.	Kaghan Ceramics Ind Pvt Ltd	Manshera	1996	Mugs, Cups etc	1.806 T. PA
13.	Mubarak Ceramics	SIE Manshera	2000	Mugs, Cups etc	0.900 Mln PA

Annex-G: Details of Vehicles registered in NWFP

Details of Vehicles registered in NWFP

Vehicles	Assumptions				Vehicles and their Classes			Fuel Consumption / Annum (tons)	
	mileage/day	km/liter	Liter/Annum	Total Vehicles	4 stroke	2 stroke	diesel engine	Petrol	Diesel
Buses/Mini Buses	300	5	21600	33198			33198	0	609515.28
Delivery Van/Pickups	300	8	13500	17630			17630	0	202304.25
Motor Cabs (Taxi)	300	10	10800	19637	9818		9819	78465.456	90138.42
Motor Cabs (Rickshaws)	250	20	4500	15162		15162		50489.46	0
Motor Car/Jeep/ST Vagon	300	12	9000	105193	52597		52596	350296.02	402359.4
Motor Cycle/Scooter	50	20	900	80604		80604		53682.264	0
Other Vehicle	250	10	9000	12080	6040		6040	40226.4	46206
Private Carrier Trucks	300	5	21600	8339			8339	0	153104.04
Public Carrier Trucks	250	5	18000	28619			28619	0	437870.7
Tractors	200	4	18000	30638			30638	0	468761.4
Total				351100	68455	95766	186879	573,160	2,410,259

Annex-H: Dioxin Factors in NWFP

SUMMARY OF DIOXIN FACTORS IN NWFP

Cat.	Source Categories	Annual Releases (g TEQ/a)				
		Air	Water	Land	Products	Residue
1	Waste Incineration	3.576	0.000	0.000	0.000	0.018
2	Ferrous and Non-Ferrous Metal Production	1.670	0.000	0.000	0.000	2.965
3	Power Generation and Heating	23.741	0.000	0.000	0.000	0.000
4	Production of Mineral Products	2101.557	0.000	0.000	0.000	0.036
5	Transportation	0.548	0.000	0.000	0.000	0.000
6	Uncontrolled Combustion Processes	313.192	0.000	0.000	0.000	626.384
7	Production of Chemicals and Consumer Goods	0.011	0.591	0.000	32.188	94.320
8	Miscellaneous	0.000	0.000	0.000	0.000	0.000
9	Disposal/ Land filling	0.000	0.000	0.000	0.000	0.000
10	Identification of Potential Hot-Spots					
1-9	Total	2444.296	0.591	0.000	32.188	723.721

Category – 1: Waste Incineration

C a t.	Sub c a t.	C l a s s	Source Categories	Potential Release Route (µg TEQ/t)					Product ion t/a	Annual release						
				A i r	Water	Land	Residues			g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	
							Fly Ash	Bottom Ash								Air
1			Waste incineration													
	a		Municipal solid waste incineration					0	0.000	0			0	.000	0	0.000
		1	Low technol. combustion, no APC system	35000		NA	NA	0	75	0.000				0	0.000	0.000
		2	Controlled comb., minimal APC	3500		NA	NA	500	15	0.000				0	0.000	0.000
		3	Controlled comb., good APC	3000		NA	NA	200	7	0.000				0	0.000	0.000
		4	High tech. combustion, sophisticated APCS	0.5		NA	NA	15	1.5	0.000				0	0.000	0.000
	b		Hazardous waste incineration					0	0.000	0			0	.000	0	0.000
		1	Low technol. combustion, no APC system	35000		NA	NA	9,000		0.000				0	0.000	0.000
		2	Controlled comb., minimal APC	3500		NA	NA	900		0.000				0	0.000	0.000
		3	Controlled comb., good APC	1000		NA	NA	450		0.000				0	0.000	0.000
		4	High tech. combustion, sophisticated APCS	0.1		NA	NA	30		0.0000				0	0.0000	0.0000

C a t.	Subc at.	C l a s s	Source Categories	Potential Release Route (µg TEQ/t)					Product ion t/a	Annual release							
				A i r	Water	Land	Products	Residues		g TEQ/a Air	g TEQ/a Water	g TEQ/a Land	g TEQ/a Products	g TEQ/a Fly ash	g TEQ/a Bottom Ash		
								Fly Ash								Bottom Ash	
				75													
	c		Medical/hospital waste incineration					89	3.576	0			0	0	0.018		
	1		Uncontrolled batch combustion, no APCS	40000		NA	NA	200	89	3.576				0.000	0	0.018	
	2		Controlled, batch, no or minimal APCS	30000		NA	NA	20		0.000				0.000		0.000	
	3		Controlled, batch comb., good APC	525		NA	NA	920	ND	0.000				0.000			
	4		High tech, continuous, sophisticated APCS	1		NA	NA	150		0.000				0.000		0.000	
	d		Light fraction shredder waste incineration						0	0.000	0		0	0.000	0.000		
	1		Uncontrolled batch comb., no APCS	1000		NA	NA	ND	ND	0.000							
	2		Controlled, batch, no or minimal APC	50		NA	NA	ND	ND	0.000							
	3		High tech, continuous, sophisticated APCS	1		NA	NA	150		0.000				0.000		0.000	
			Sewage sludge incineration						0	0.000	0		0	0.000	0.000		

C a t.	Sub cat.	C l a s s	Source Categories	Potential Release Route (µg TEQ/t)					Product ion t/a	Annual release					
				A i r	Water	Land	Products	Residues Fly Ash Bottom Ash		g TEQ/a Air	g TEQ/a Water	g TEQ/a Land	g TEQ/a Products	g TEQ/a Fly ash	g TEQ/a Bott om Ash
		1	Old furnaces, batch, no/little APCS	50		NA	NA	23		0.000				0.000	0.000
		2	Updated, continuously, some APCS	4		NA	NA	0.5		0.000				0.000	0.000
		3	State-of-the-art, full APCS	0.4		NA	NA	0.5		0.000				0.000	0.000
			Waste wood and waste biomass incineration						0	0.000	0		0	0.000	0.000
		1	Old furnaces, batch, no/little APCS	1000		NA	NA	1,000		0.000				0.000	0.000
		2	Updated, continuously, some APCS	10		NA	NA	10		0.000				0.000	0.000
		3	State-of-the-art, full APCS	1		NA	NA	0.2		0.000				0.000	0.000
			Animal carcasses burning						0	0.000	0		0	0.000	0.000
		1	Old furnaces, batch, no/little APCS	500		NA	NA	ND		0.000				0.000	
		2	Updated, continuously, some APCS	50		NA	NA	ND		0.000				0.000	
		3	State-of-the-art, full APCS	5		NA	NA	ND		0.000				0.000	
Waste Incineration										3.576	0		0	0.000	0.018

Category-2: Ferrous and Non-Ferrous Metal Production

			Source Categories	Potential Release Route (µg TEQ/t)	Product ion	Annual release
--	--	--	-------------------	------------------------------------	----------------	----------------

Facility	Subcategory	Class	Source Categories	Potential Release Route (µg TEQ/t)					Production (t/a)	Annual release				
				Air	Water	VOC and	Products	Residues		TEQ/a	TEQ/a	TEQ/a	TEQ/a	g TEQ/a
			APCS			D	D	D						
		2	Rotary Drum - fabric filter	4.3	ND	D	D	D	0.2	.000				0.000
		3	Cold air cupola, fabric filter	1	ND	D	D	D	8	.000				0.000
		4	Hot air cupola or induction furnace, fabric filter	0.03	ND	D	D	D	0.5	.000				0.000
			Copper production											
		1	Sec. Cu - Basic technology	800	ND	D	D	D	630	.000	.0	.0	.0	0.000
		2	Sec. Cu - Well controlled	50	ND	D	D	D	630	.000				0.000
		3	Sec. Cu - Optimized for PCDD/PCDF control	5	ND	D	D	D	300	.000				0.000
		4	Smelting and casting of Cu/Cu alloys	.03	ND	A	A	D	NA	.000				
		5	Prim. Cu – including thermal steps	01	ND	D	D	D	NA	.000				
			Aluminum production (all sec.)						630	.395				1.052
		1	Processing scrap Al, minimal treatment of inputs, simple dust removal	0	ND	D	ND	400	2,630	.395				1.052
		2	Scrap treatment, well controlled, good APCS	5	ND	D	ND	400		.000				0.000
		3	Shavings/turning drying		NA	A	NA	NA						

Facility	Subcategory	Class	Source Categories	Potential Release Route (µg TEQ/t)				Production (t/a)	Annual release					
				Air	Water	Land	Products		Residues	TEQ/a	TEQ/a	TEQ/a	TEQ/a	g TEQ/a
		4	Scrap treatment, well-controlled, fabric filter, lime injection		ND	D	ND	100						0.000
		5	Optimized process, optimized APCS	.5	ND	ND	ND	400						0.000
			Lead production						0	.000				0
		1	Sec. lead from scrap, PVC battery separators	0	ND	ND	ND	ND		.000				
		2	Sec. from PVC/Cl2 free scrap, filters		ND	ND	ND	ND		.000				
		3	Sec. Lead, PVC/Cl2 free scrap in modern furnaces, with scrubber	.5	ND	ND	ND	ND		.000				
			Zinc production						0	.000				0
		1	Kiln with no dust control	.000	ND	ND	ND	ND		.000				
		2	Hot briquetting/rotary furnaces, basic control	.00	ND	ND	ND	ND		.000				
		3	Comprehensive control		ND	ND	ND	ND		.000				
		4	Melting (only)	.3	ND	ND	ND	ND		.000				
			Brass and bronze production							0.000	0		0	0
		1	Simple melting furnaces	0	ND	ND	ND	ND		0.000				
		2	Sophisticated equipment, e.g. induction ovens with APCS	.1	ND	ND	ND	ND		0.000				

Category	Subcategory	Class	Source Categories	Potential Release Route (µg TEQ/t)					Production (t/a)	Annual release				
				Air	Water	VOC and	Products	Residues		TEQ/a	TEQ/a	TEQ/a	TEQ/a	g TEQ/a
			Magnesium production Using MgO/C thermal treatment in CI2, no effluent treatment, poor APCS Using MgO/C thermal treatment in CI2, comprehensive pollution control Thermal reduction process	50	9,000	NA	D	0	0.000	0.000	0.000	0	0.000	0.000
			Thermal Non-ferrous metal production (e.g., Ni) Contaminated scrap, simple or no dust control Clean scrap, good APCS	00	ND	ND	D	ND	0.000	0.000	0.000	0	0.000	0
			Shredders Metal shredding plants	.2	NA	NA	D	ND	0.000	0.000	0.000	0	0.000	0
			Thermal wire reclamation Open burning of cable Basic furnace with after burner, wet scrubber Burning electric motors, brake shoes, etc., afterburner	,000	ND	ND	D	ND	0.000	0.000	0.000	0	0.000	0
				0	ND	NA	D	ND	0.000	0.000	0.000	0	0.000	0
				.3	ND	NA	D	ND	0.000	0.000	0.000	0	0.000	0

State	Subcategory	Class	Source Categories	Potential Release Route (µg TEQ/t)					Production (t/a)	Annual release				
				Air	Water	Land	Products	Residues		TEQ/a	TEQ/a	TEQ/a	TEQ/a	TEQ/a
			Ferrous and Non-Ferrous Metal Production						.670	0.000	.000	0.000	2.965	

Category-3 Power Generation and Heating/Cooking

at.	Subcat.	Class	Source Categories	Potential Release Route (µg TEQ/TJ)					Production TJ/a	Annual release				
				Air	Water	Land	Products	Residues		g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a
3			Power Generation and Heating/Cooking											
	a		Fossil fuel power plants						0	0.000	0	0	0	0.0
		1	Fossil fuel/waste co-fired power boilers	35	ND	NA	NA	ND		0.000				
		2	Coal fired power boilers	10	ND	NA	NA	14		0.000				0.0
		3	Heavy fuel fired power boilers	2.5	ND	NA	NA	ND		0.000				
		4	Light fuel oil/natural gas fired power boilers	0.5	ND	NA	NA	ND		0.000				
	b		Biomass Power Plants						\	0.000	0	0	0	0.0
		1	1. Other biomass fired power boilers	500	ND	NA	NA	ND		0.000				
		2	2. Wood fired power boilers	50	ND	NA	NA	15		0.000				0.0
	c		Landfill and biogas combustion						0	0.000	0	0	0	0.0
		1	Biogas-fired boilers, motors/turbines and flaring	8	ND	NA	NA	NA		0.000				
	d		Household heating and cooking - Biomass						235,782	23.578	0	0	0	4.7
		1	Contaminated wood/biomass fired stoves	1,500	ND	NA	NA	2,000		0.000				0.0
		2	Virgin wood/biomass fired stoves	100	ND	NA	NA	20	235781.57	23.578				4.7
	e		Domestic heating - Fossil fuels						39,234	0.163	0	0	0	0.0
		1	Coal fired stoves	70	ND	NA	NA	5,000		0.000				0.0
		2	Oil fired stoves	10	ND	NA	NA	ND	12273.33	0.123				

		3	Natural gas fired stoves	1.5	ND	NA	NA	ND	26,961	0				
Power Generation and Heating/Cooking										3.741	0	0	0	4.7

Category-4: Production of Mineral Products

Cat	Subcat.	Class	Source Categories	Potential Release Route (µg TEQ/t)					Production t/a	Annual release				
				Air	Water	Land	Products	Residues		g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	TEQ/a
4			Production of Mineral Products						Air	Water	Land	Products	Residues	
	a		Cement kilns											
		1	Wet kilns, ESP temperature >300 °C	5	NA	ND	ND	1	11,844,000	0.592	0	0	0	0.036
		2	Wet kilns, ESP/FF temperature 200 to 300 °C	0.6	NA	ND	ND	0.1	0.000	0.000				0.000
		3	Wet kilns, ESP/FF temperature <200 °C and all types of dry kilns	0.05	NA	ND	ND	0.003	11,844,000	0.592				0.036
	b		Lime						0	0.000	0	0	0	0
		1	Cyclone/no dust control	10	ND	ND	ND	ND	0.000	0.000				
		2	Good dust abatement	0.07	ND	ND	ND	ND	0.000					
	c		Brick						10,500,000	2100.000	0	0	0	0
		1	Cyclone/no dust control	0.2	NA	ND	ND	ND	10,500,000	2100.000				
		2	Good dust abatement	0.02	NA	ND	ND	ND	0.000					
	d		Glass						4,603,650	0.921	0	0	0	0
		1	Cyclone/no dust control	0.2	NA	ND	ND	ND	4,603,650	0.921				
		2	Good dust abatement	0.015	NA	ND	ND	ND	0.000					
	e		Ceramics						18,360	0.000	0	0	0	0
		1	Cyclone/no dust control	0.2	NA	ND	ND	ND	0.000	0.000				
		2	Good dust abatement	0.02	NA	ND	ND	ND	18,360	0.000				

Cat.	Subcat.	Class	Source Categories	Potential Release Route (µg TEQ/t)					Production t/a	Annual release				
				Air	Water	Land	Products	Residues		g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	TEQ/a
	f		Asphalt mixing						630,000	0.044	0	0	0	0.000
		1	Mixing plant with no gas cleaning	0.07	NA	ND	ND	ND	630,000	0.044				
		2	Mixing plant with fabric filter, wet scrubber	0.007	NA	ND	ND	0.06		0.000				0.000
4	Production of Mineral Products								10,517,096,010	2101.557	0	0	0	0.036

Category-5 Transport

Cat	Subcat.	Class	Source Categories	Potential Release Route (µg TEQ/t)					Consumption t/a *	Annual release				
				Air	Water	Land	Products	Residues		TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a
5			Transport						Air	Water	Land	Products	Residues	
	a		4-Stroke engines											
		1	Leaded fuel	2.2	NA	NA	NA	ND	468,989	0.047	0	0	0	0
		2	Unleaded fuel without catalyst	0.1	NA	NA	NA	ND	468,989	0.047				
		3	Unleaded fuel with catalyst	0.00	NA	NA	NA	NA		0.000				
	b		2-Stroke engines											
		1	Leaded fuel	3.5	NA	NA	NA	ND	104,171	0.260		0	0	0
		2	Unleaded fuel without catalyst	2.5	NA	NA	NA	ND	104,171	0.260				
	c		Diesel engines											
		1	Diesel engines	0.1	NA	NA	NA	ND	2,410,259	0.241	0	0	0	0
	d		Heavy oil fired											
									0	0.000	0	0	0	0

			engines												
		1	All types	4	NA	NA	NA	ND		0.000					
5			transport							0.548	0	0	0		0

* Assuming that consumption equals sales

Conversion factors: volume --> mass	L	kg
Gasoline	1	0.74
Diesel	1	0.85

Category-6: Uncontrolled Combustion Processes

Cat.	Subcat.	Class	Source Categories	Potential Release Route (µg TEQ/t)					Production t/a	Annual release				
				Air	Water	Land	Products	Residues		g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a
6	6		Uncontrolled Combustion Processes							Air	Water	Land	Products	Residues
	a		Fires/burnings - biomass					0		0.000	0	0.000	0	0
		1	Forest fires	5	ND	4	NA	ND		0.000		0.000		
		2	Grassland and moor fires	5	ND	4	NA	ND		0.000		0.000		
		3	Agricultural residue burning (in field), not impacted	0.5	ND	10	NA	ND		0.000		0.000		
		4	Agricultural residue burning (in field), impacted, poor combustion conditions	30	ND	10	NA	ND		0.000		0.000		
	b		Fires, waste burning, landfill fires, industrial fires, accidental fires					1,043,973		313.192	0	0.000	0	626.384
		1	Landfill fires	1,000	ND	NA	NA	ND		0.000				
		2	Accidental fires in houses, factories (per event)	400	ND	See residues	NA	400		0.000				0.000
		3	Uncontrolled domestic waste burning	300	ND	See residues	NA	600	1,043,973	313.192				626.384
		4	Accidental fires in vehicles (per vehicle)	94	ND	See residues	NA	18		0.000				0.000
		5	Open burning of wood (construction/demolition)	60	ND	ND	NA	10		0.000				0.000
6	6		Uncontrolled Combustion Processes							313.192	0	0.000	0	626.384

Category-7: Production of Chemicals, Consumer Goods

Classes	Source Categories	Potential Release Route (µg TEQ/t)					Production t/a	Annual release				
		Air	Water	Land	Products	Residues		g TEQ/a Air	g TEQ/a Water	g TEQ/a Land	g TEQ/a Products	g TEQ/a Residues
	Production of Chemicals, Consumer Goods											
1	Pulp and paper mills <i>Boilers (per ton of pulp)</i> Black liquor boilers, burning of sludges, wood	0.07				1000	91,000	0.006	0	0	0	91,000
2	2. Bark boilers only	0.4				1000		0.000				0.000
	<i>Sludges</i>	Water		Residue			91,000		0.410			9.100
		µg TEQ/A Dt	pg TEQ/L	µg TEQ/A Dt	µg TEQ/t sludge							
1	Kraft process, old technology (Cl2)	4.5	70	4.5	100	91,000		0.410				9.100
2	Kraft process, modern technology (ClO2)	0.06	2	0.2	10			0.000				0.000
3	TMP pulp							0.000				0.000
4	Recycling pulp							0.000				0.000
	<i>Pulp and paper</i>	Air	Water	Land	Products	Residues	91,000	0	0	0	0.728	0
1	Kraft pulps/papers from primary fibers, Cl2				8		91,000				0.728	
2	Sulfite papers, old technology (Cl2)				1						0.000	
3	Kraft papers, new technology (ClO2, TCF), unbleached papers				0.5						0.000	
4	Sulfite papers, new technology (ClO2, TCF)				0.1						0.000	
5	Recycling paper				10						0.000	

Class	Source Categories	Potential Release Route (µg TEQ/t)					Production t/a	Annual release				
		Air	Water	Land	Products	Residues		g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a
1	Chemical industry	Air	Water	Land	Products	Residues	0	0	0	0	0.000	0
	<i>PCP</i>											
	European, American production (chlorination of phenol with Cl ₂)				2,000,000							
2	Chinese production (thermolysis of HCH)				800,000					.000		
3	PCP-Na				500					.000		
1	PCB	Air	Water	Land	Products	Residues	0	0	0	.000	0	
		Low chlorinated, e.g., Clophen A30, Aroclor 1242				15,000						
		Medium chlorinated, e.g., Clophen A40, Aroclor 1248				70,000						
		Medium chlorinated, e.g., Clophen A50, Aroclor 1254				300,000						
2	High chlorinated, e.g., Clophen A60, Aroclor 1260				1,500,000				.000			
3									.000			
4									.000			
1	Chlorinated Pesticides	Air	Water	Land	Products	Residues	0	0	0	.000	0	
		Pure 2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)				7,000						
		2,4,6-Trichlorophenol (2,4,6-PCPh)				700						
		Dichlorprop				1,000						
2	2,4-Dichlorophenoxy acetic acid (2,4-D)				700				.000			

Class	Source Categories	Potential Release Route (µg TEQ/t)					Production t/a	Annual release										
		Air	Water	Land	Products	Residues		g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a						
5	2,4,6-Trichlorophenyl-4'-nitrophenyl ether (CNP = chloronitrofen)						0	0	0		.000	0						
	Old technology				300,000											.000		
	New technology				400											.000		
6	Chlorobenzens				ND	ND												
7	Chlorine production with graphite anodes				NA	ND												
1	<i>Chloranil</i>	Air	Water	Land	Products	Residues	23,450	0	0		8.140	0						
	<i>p</i> -chloranil via chlorination of phenol				400,000											.000		
	<i>p</i> -chloranil via hydrochinone				100											.000		
	Dyestuffs on chloranil basis (old process, Class 1)				1,200											8.140		
4	<i>o</i> -chloranil via chlorination of phenol				60,000					.000								
1	<i>ECD/VCM/PVC</i>	Air	Water	Land	Products	Residues	93,548	0.004979	0.591482		.320	3.320						
	Old technology, EDC/VCM, PVC		1															
	Modern plants																	
	EDC/VCM and/or EDC/VCM/PVC	0.95	0.015		0.03	2								0	0			0.000
2	PVC only	0.0003	0.03		0.1	0.2	16,597,812	0.004979	0.497934		.660	3.320						
1	Petroleum refineries	Air	Water	Land	Products	Residues	0	0	0			0						
	All types	ND	NA	NA	NA	ND												
	Textile plants	Air	Water	Land	Products	Residues	0	0	0			0						

Class	Source Categories	Potential Release Route (µg TEQ/t)					Production t/a	Annual release				
		Air	Water	Land	Products	Residues		g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a	g TEQ/a
1	Upper limit	NA	ND	NA	100	ND						
2	Lower limit	NA	ND	NA	0.1	ND						
	Leather plants	Air	Water	Land	Products	Residues	0		0			0
1	Upper limit	NA	ND	NA	1,000	ND						
2	Lower limit	NA	ND	NA	10	ND						
All Main Sectors								.011	0.591		2.188	94.320

Annex-I: Questionnaires Hospital Waste

Category 1 - Waste Incineration

Type of Plant	Municipal solid waste	[]
	Industrial waste	[]
	Hospital waste	[<input checked="" type="checkbox"/>]
	Light shredder	[]
	Sewage sludge	[]
	Waste wood and waste biomass	[]
	Animal carcasses	[]
Name of Plant	Hayatabad Medical Complex	
Location (City/Province)	Peshawar	
Address	Hayat Abad, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Dr. Salar DMS Khalid Khan, Engineer Shehzad, Supervisor 091-9217140	
Number of Furnaces	1	
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[2-3 hour/day]
Annual Operational/Capacity (per Unit)	t/h (tons per hour)	0.03
	h/d (hours per day)	3
	d/w (days per week)	3
	t/d (tons per day)	0.1
	d/a (days per year)	156
	h/a (hours per year)	468
	t/a (tons per year)	15.6
Annual	t/h (tons per hour)	0.03

Operation/Capacity (total)	h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	3 3 0.1 156 468 15.6
Type of Furnace	Mass burn waterwall (grate) Fluidized bed Stoker Rotary kiln Other (please specify)	Gas Fed Incinerator
Temperature in Furnace	Main furnace (°C) Afterburner/second chamber (°C)	600°C - 800°C

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None	[√]	
Heat Recovery System	Yes []	No [√]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste)Water	t/a []	Disposal []
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues

	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Note:

- **No heat recovery system exists**
- **The residue/ashes collected never quantified and buried it inside the boundary wall of hospital near incinerator.**

Category 1 -

Waste Incineration

Type of Plant	Municipal solid waste	[]
	Industrial waste	[]
	Hospital waste	[<input checked="" type="checkbox"/>]
	Light shredder	[]
	Sewage sludge	[]
	Waste wood and waste biomass	[]
	Animal carcasses	[]
Name of Plant	Ayub Medical College	
Location (City/Province)	Abbottabad	
Address	Manshera Road Abbottabad	
Contact (Name, position, phone and fax numbers, e-mail)	Syed Zulfiqar Shah 0992-381907-14 Ext 3308	
Number of Furnaces	1	
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	
Annual Operational/Capacity (per Unit)	t/h (tons per hour)	0.01
	h/d (hours per day)	2
	d/w (days per week)	6
	t/d (tons per day)	0.02
	d/a (days per year)	300
	h/a (hours per year)	600
	t/a (tons per year)	6
Annual Operation/Capacity (total)	t/h (tons per hour)	0.01
	h/d (hours per day)	2
	d/w (days per week)	6
	t/d (tons per day)	0.02

	d/a (days per year)	300
	h/a (hours per year)	600
	t/a (tons per year)	6
Type of Furnace	Mass burn waterwall (grate) Fluidized bed Stoker Rotary kiln Other (please specify)	Gas Fed Incinerator
Temperature in Furnace	Main furnace (°C) Afterburner/second chamber (°C)	600°C - 800°C

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None	[√]	
Heat Recovery System	Yes []	No [√]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a [6]	Recirculation []	Landfill [√]
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues

	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Note:

- **No heat recovery system exists**
- **The residue/ashes collected in shopping bags and dumped in Municipal Waste Bin inside Hospital.**

Category 1 -

Waste Incineration

Type of Plant	Municipal solid waste	[]
	Industrial waste	[]
	Hospital waste	[<input checked="" type="checkbox"/>]
	Light shredder	[]
	Sewage sludge	[]
	Waste wood and waste biomass	[]
	Animal carcasses	[]
Name of Plant	Lady Reading Hospital,	
Location (City/Province)	Peshawar	
Address	Near Bala Hisar Fort, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Dr. Mukhtiar DMS, 0333-9133245 Engr. Sujaat Ali Khan, 0300-5920061	
Number of Furnaces	1	
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	
Annual Operational/Capacity (per Unit)	t/h (tons per hour)	0.03
	h/d (hours per day)	6
	d/w (days per week)	6
	t/d (tons per day)	0.20
	d/a (days per year)	300
	h/a (hours per year)	1800
	t/a (tons per year)	60
Annual Operation/Capacity (total)	t/h (tons per hour)	0.03
	h/d (hours per day)	6
	d/w (days per week)	6
	t/d (tons per day)	0.20
	d/a (days per year)	300

	h/a (hours per year)	1800
	t/a (tons per year)	60
Type of Furnace	Mass burn waterwall (grate) Fluidized bed Stoker Rotary kiln Other (please specify)	Gas Fed Incinerator
Temperature in Furnace	Main furnace (°C) Afterburner/second chamber (°C)	600°C - 800°C

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None	[√]	
Heat Recovery System *	Yes []	No [√]
	Temperature of Gases	At entry to APCS (°C) [] At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues **		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues

	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Note:

* **No heat recovery system exists**

** **The residue/ashes collected never quantified and dumped in Municipal Waste Bin inside Hospital for disposal.**

Category 1 -

Waste Incineration

Type of Plant	Municipal solid waste	[]
	Industrial waste	[]
	Hospital waste	[√]
	Light shredder	[]
	Sewage sludge	[]
	Waste wood and waste biomass	[]
	Animal carcasses	[]
Name of Plant	Khyber Teaching Hospital	
Location (City/Province)	Peshawar	
Address	Opposite Peshawar University, Khyber Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Ajmal Saeed, Maintenance Engineer 091-9216340-47 Ext-2007	
Number of Furnaces	1	
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[√]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	
Annual Operational/Capacity (per Unit)	t/h (tons per hour)	0.10
	h/d (hours per day)	0.5
	d/w (days per week)	6
	t/d (tons per day)	0.05
	d/a (days per year)	156
	h/a (hours per year)	78
	t/a (tons per year)	7.8
Annual Operation/Capacity (total)	t/h (tons per hour)	0.10
	h/d (hours per day)	0.5
	d/w (days per week)	6

	t/d (tons per day)	0.05
	d/a (days per year)	156
	h/a (hours per year)	78
	t/a (tons per year)	7.8
Type of Furnace	Mass burn waterwall (grate)	
	Fluidized bed	
	Stoker	
	Rotary kiln	
	Other (please specify)	Gas Fed Incinerator
Temperature in Furnace (°C)	Main furnace (°C)	600°C - 800°C
	Afterburner/second chamber (°C)	

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None	[<input checked="" type="checkbox"/>]	
Heat Recovery System **	Yes []	No [<input checked="" type="checkbox"/>]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes ***	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Note:

*** 3 days per week**

**** No heat recovery system exists**

***** The residue/ashes collected in shopping bags and dumped in Municipal Waste Bin inside Hospital.**

Annex-J: Questionnaires Mineral Production

Category 4

Mineral Production

Type of Plant	Cement Lime Brick Glass Ceramics Asphalt mixing	[] [] [] [√] [] []
Address	Murree Glass Ind Plpt #: 24, Phase III, IE Hattar, Haripur	
Contact <small>(Name, position, phone and fax numbers, e-mail)</small>	Mr. Abdul Qayuum, Group Electrical Engineer Phone: 617233, Fax: 617494	
Number of Furnaces		
Feed Materials <small>(type, quantity = t/a)</small>	Silican Sand Soda Ash Lime Stone	5400 3600 3000
Primary Fuel <small>(type, quantity = t/a)</small>		
Secondary/Alternative Fuel <small>(type, quantity = t/a)</small>		
Type of Process	Dry []	Wet []
Type of Operation	Batch (e.g., 100 kg per batch) Semi-continuous (e.g., 8 hours per day) Continuous (24 hours per day)	[] [] []
Annual Operational/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day) d/w (days per week)	24 6

	t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	300 7200
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Type of Furnace	Rotary kiln Shaft kiln Tunnel furnace Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)	[]	
None	[]	
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues		
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste) Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues

	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Category 4

Mineral Production

Type of Plant	Cement	[]
	Lime	[]
	Brick	[]
	Glass	[<input checked="" type="checkbox"/>]
	Ceramics	[]
	Asphalt mixing	[]
Address	Ghani Glass Ind Shadi, Hattar Haripur	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mohammad Arshad, Manager Admn Phone: 617561, Fax: 617566	
Number of Furnaces		
Feed Materials (type, quantity = t/a)	Silicon Sand, Soda Ash, Lime Stone, Old Glasses	12000
Primary Fuel (type, quantity = t/a)		
Secondary/Alternative Fuel (type, quantity = t/a)		
Type of Process	Dry []	Wet []
Type of Operation	Batch (e.g., 100 kg per batch)	[]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)	t/h (tons per hour)	1.458
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	35

	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	10500
Annual Operation/Capacity (total)	t/h (tons per hour)	1.458
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	35
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	10500
Type of Furnace	Rotary kiln Shaft kiln Tunnel furnace Other (please specify)	
Temperature Furnace	in Main furnace (°C) Second chamber/afterburner (°C)	

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)	[]	
None	[]	
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste) Water	t/a []	Disposal []
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues

	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Type of Plant	Cement	[]
	Lime	[]
	Brick	[]
	Glass	[]
	Ceramics	[<input checked="" type="checkbox"/>]
	Asphalt mixing	[]
Address	Durrani Ceramics Pvt Ltd Plot No. 53/1, Phase I&II, IE Hattar, Haripur	
Contact Name, position, phone and fax numbers, e-mail)	Mr. Nazir Ahmad	
Number of Furnaces		
Feed Materials (type, quantity = t/a)	Clay	2400
Primary Fuel (type, quantity = t/a)	Natural Gas Electricity	Rs.300,000 pm Rs.60,000 pm
Secondary/Alternative Fuel (type, quantity = t/a)		
Type of Process	Dry [<input checked="" type="checkbox"/>]	Wet [<input type="checkbox"/>]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)	t/h (tons per hour)	1
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	8
	d/a (days per year)	300

	h/a (hours per year)	2400
	t/a (tons per year)	2400
Annual Operation/Capacity (total)	t/h (tons per hour)	1
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	8
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	2400
Type of Furnace	Rotary kiln Shaft kiln Tunnel furnace Other (please specify)	√
Temperature in Furnace	Main furnace (°C)	1000°C
	Second chamber/afterburner (°C)	1100°C
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None	[√]	
Heat Recovery System	Yes []	No [√]
	Temperature of Gases	At entry to APCS (°C)[]
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues*		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste) Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a [20% of production]	Recirculation [√]	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

	Emission Factor (µg TEQ/t)				
Class	Air	Water	Land	Product	Residues
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

***Solid Waste is created in the form of bricks and clay which is crushed and reused.**

Category 4
Mineral Production

Type of Plant	Cement	[]
	Lime	[]
	Brick	[]
	Glass	[]
	Ceramics	[<input checked="" type="checkbox"/>]
	Asphalt mixing	[]
Address	Peshawar Ceramics (Pvt) Ltd Plot #: W3, IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Fazullah, Chief Executive Phone: 814733	
Number of Furnaces	5	
Feed Materials (type, quantity = t/a)	China Clay	120
	Fine Clay	120
	Plastic Clay	96
	Feldspar	48
	Silicon Sand	60
Primary Fuel (type, quantity = t/a)	Gas	4 mcf
Secondary/Alternative Fuel (type, quantity = t/a)	Electricity	25 KVA
Type of Process	Dry [<input checked="" type="checkbox"/>]	Wet []
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)	n/h (nos per hour)	20.83
	h/d (hours per day)	8
	d/w (days per week)	6

	n/d (nos per day)	500
	d/a (days per year)	300
	h/a (hours per year)	2400
	n/a (nos per year)	150000
Annual Operation/Capacity (total)	n/h (nos per hour)	20.83
	h/d (hours per day)	8
	d/w (days per week)	6
	n/d (nos per day)	500
	d/a (days per year)	300
	h/a (hours per year)	2400
	n/a (nos per year)	150000
Type of Furnace	Rotary kiln	
	Shaft kiln	
	Tunnel furnace	5
	Other (please specify)	
Temperature in Furnace	Main furnace (°C)	1000
	Second chamber/afterburner (°C)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
Other (please specify)		
None	[√]	
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C)[]	At exit from APCS (°C) []

Flux of Exit Gases	(m ³ /h) (dry gas)	
--------------------	-------------------------------	--

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste) Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

	Emission Factor (µg TEQ/t)				
Class	Air	Water	Land	Product	Residues
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Category 4

Mineral Production

Type of Plant	Cement	[]
	Lime	[]
	Brick	[]
	Glass	[]
	Ceramics	[<input checked="" type="checkbox"/>]
	Asphalt mixing	[]
Address	Frontier Ceramics Industries, IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Zulfiqar Ahmad, Admn Officer Phone: 812360, Fax: 812757	
Number of Furnaces	3	
Feed Materials (type, quantity = t/a)	China Clay	24
	Ball Clay	36
	Feldspr	60
	Sand Plastic Clay	96
	Glass Firit	60
	Pigment	
Primary Fuel (type, quantity = t/a)	Gas	22500 hm3
Secondary/Alternative Fuel (type, quantity = t/a)	Furnace Oil	2880
Type of Process	Dry [<input checked="" type="checkbox"/>]	Wet []
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)	t/h (tons per hour)	3 sqm
	h/d (hours per day)	24
	d/w (days per week)	6

	t/d (tons per day)	72 sqm
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	21600 sqm
Annual Operation/Capacity (total)	t/h (tons per hour)	3 sqm
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	72 sqm
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	21600 sqm
Type of Furnace	Rotary kiln	
	Shaft kiln	
	Tunnel furnace	3
	Other (please specify)	
Temperature in Furnace	Main furnace (°C)	
	Second chamber/afterburner (°C)	

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]	
	Cyclone	[]	
	Bagfilter	[]	
	Wet scrubber	[]	
	Dry scrubber	[]	
	Lime injection	[]	
	NaOH/alkali injection	[]	
	Active carbon/coke injection	[]	
	Active carbon filter	[]	
	Catalytic converter (SCR)	[]	
	Induced or forced draft fan	[]	
Other (please specify)			
None	[<input checked="" type="checkbox"/>]		
Heat Recovery System	Yes []	No []	
Temperature of Gases	At entry to APCS (°C)[]	At exit from APCS (°C) []	
Flux of Exit Gases	(m³/h) (dry gas)		
Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste) Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 4

Mineral Production

Type of Plant	Cement	[]
	Lime	[]
	Brick	[]
	Glass	[]
	Ceramics	[√]
	Asphalt mixing	[]
Address	Sarhad Ceramics, Jalo Road, SIE Manshera	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Zubair Shah , Share Holder	
Number of Furnaces	1	
Feed Materials (type, quantity = t/a)	Sand clay Swat China Clay	1- 3 ton / day 2 trucks/month
Primary Fuel (type, quantity = t/a)	Natural Gas	
Secondary/Alternative Fuel (type, quantity = t/a)	n/a	
Type of Process	Dry [√]	Wet []
Type of Operation	Batch (e.g., 100 kg per batch)	[√] 22 batches/day
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)*	t/h (tons per hour)	0.25
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	2
	d/a (days per year)	200

		h/a (hours per year)	2400
		t/a (tons per year)	400
Annual Operation/Capacity (total)		t/h (tons per hour)	0.25
		h/d (hours per day)	8
		d/w (days per week)	6
		t/d (tons per day)	2
		d/a (days per year)	200
		h/a (hours per year)	2400
		t/a (tons per year)	400
Type of Furnace		Rotary kiln Shaft kiln Tunnel furnace Other (please specify)	√
Temperature Furnace	in	Main furnace (°C) Second chamber/afterburner (°C)	1000 °C

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None	[√]	
Heat Recovery System	Yes []	No [√]
Temperature of Gases**	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	Dry Gases

Residues***		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste) Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues

	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

*** The unit is closed for 4 months in Winter due to Gas Shortage**

**** Never measured**

***** Waste is dumped outside factory in an open plot**

Type of Plant	Cement	[]
	Lime	[]
	Brick	[]
	Glass	[]
	Ceramics	[<input checked="" type="checkbox"/>]
	Asphalt mixing	[]
Address	Kaghan Ceramics, Jalo Road, SIE Manshera	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Zakir Hussain Shah, Director Phone: 0987-302454	
Number of Furnaces	2	
Feed Materials (type, quantity = t/a)	Sind clay Swat China Clay	2- 6 ton / day 1 truck/week
Primary Fuel (type, quantity = t/a)	Natural Gas	
Secondary/Alternative Fuel (type, quantity = t/a)	n/a	
Type of Process	Dry [<input checked="" type="checkbox"/>]	Wet []
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)*	t/h (tons per hour)	0.63
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	5
	d/a (days per year)	200
	h/a (hours per year)	1600

	t/a (tons per year)	1000
Annual Operation/Capacity (total)	t/h (tons per hour)	0.63
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	5
	d/a (days per year)	200
	h/a (hours per year)	1600
	t/a (tons per year)	1000
Type of Furnace	Rotary kiln	
	Shaft kiln	
	Tunnel furnace	√
	Other (please specify)	
Temperature Furnace	Main furnace (°C)	500 – 600 °C
	Second chamber/afterburner (°C)	1000 – 1200 °C

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None	[<input checked="" type="checkbox"/>]	
Heat Recovery System	Yes []	No [<input checked="" type="checkbox"/>]
Temperature of Gases**	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	Dry Gases

Residues***		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste) Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

	Emission Factor (µg TEQ/t)				
Class	Air	Water	Land	Product	Residues

	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

* **The unit is closed for 4 months in Winter due to Gas Shortage**

** **Never measured**

*** **Waste is dumped outside factory in an open plot**

Annex-K: Questionnaires Ferrous and Non Ferrous

Category 2		Ferrous and Non-Ferrous Metal Production	
Plant Type of			[]
	Sinter		[]
	Coke		[]
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary [√]
	Copper	Primary []	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc		[]
	Brass/Bronze	Primary []	Secondary []
	Magnesium		[]
	Other non-ferrous	Primary []	Secondary []
	Shredder		[]
Other	Primary []	Secondary []	
Address		Folad Ltd Plot #: 95-B, IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)		Mr. Owais Ahmad Ghani, MD Phone: 812392	
Number of Furnaces			
Type of Operation		Batch (e.g., 100 kg per batch)	[√]
		Semi-continuous (e.g., 8 hours per day)	[]
		Continuous (24 hours per day)	[]
Annual Operational/Capacity (per		t/h (tons per hour)	
		h/d (hours per day)	8

Unit)	d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	6 300 2400
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bagfilter Wet scrubber Dry scrubber Lime injection NaOH/alkali injection Active carbon/coke injection Active carbon filter Catalytic converter (SCR)	[] [] [] [] [] [] [] [] []

	Induced or forced draft fan Other (please specify) None	[] []
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Plant Type of	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary [√]
	Copper	Primary []	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
Other	Primary []	Secondary []	
Address		Khurram Steel Casting Ltd Plot #: 94-A, IE Jamrud road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)		Mr. Naeem Amjad, Owner Phone: 812390	
Number of Furnaces			
Type of Operation	Batch (e.g., 100 kg per batch)	[√]	
	Semi-continuous (e.g., 8 hours per day)	[]	
	Continuous (24 hours per day)	[]	
Annual Operational/Capacity (per Unit)	t/h (tons per hour)		0.1
	h/d (hours per day)		8
	d/w (days per week)		6

	t/d (tons per day)	0.8
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	240
Annual Operation/Capacity (total)	t/h (tons per hour)	0.1
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	0.8
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	240
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bagfilter Wet scrubber Dry scrubber Lime injection NaOH/alkali injection Active carbon/coke injection Active carbon filter Catalytic converter (SCR) Induced or forced draft fan	[] [] [] [] [] [] [] [] [] [] []

	Other (please specify)	
	None	[]
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues	Disposal of these Residues		
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Plant Type of	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary [√]
	Copper	Primary []	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
Other	Primary []	Secondary []	
Address		Lahore Steel Pvt Ltd	
		Plot No. 60-61, IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)		Haji Bakht Mohammad, Managing Director	
		Ph: 815319, 815399	
Number of Furnaces		One	
Type of Operation		Batch (e.g., 100 kg per batch)	[√]
		Semi-continuous (e.g., 8 hours per day)	[]
		Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)		t/h (tons per hour)	1.5
		h/d (hours per day)	8
		d/w (days per week)	6
		t/d (tons per day)	12

	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	3600
Annual Operation/Capacity (total)	t/h (tons per hour)	1.5
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	12
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	3600
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C)	1600°C
	Second chamber/afterburner (°C)	1600°C
Primary Fuel	Type Furnace Oil	t/a 720
Secondary/Alternative Fuel	Type Electricity	t/a or % Rs.2,000,000 pm
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
	Other (please specify)	

	None	[√]
Heat Recovery System	Yes []	No [√]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a [] 6% of raw material	Recirculation []	Landfill [√]

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Plant Type of	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary [√]
	Copper	Primary []	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
Other	Primary []	Secondary []	
Address		MYKA Steel Pvt Ltd IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)		Director Phone: 815780, Fax: 814941	
Number of Furnaces			
Type of Operation		Batch (e.g., 100 kg per batch)	[√]
		Semi-continuous (e.g., 8 hours per day)	[]
		Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)		t/h (tons per hour)	4
		h/d (hours per day)	8
		d/w (days per week)	6

	t/d (tons per day)	32
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	384
Annual Operation/Capacity (total)	t/h (tons per hour)	4
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	32
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	384
Type of Furnace	Blast furnace	
	Induction furnace	
	Electric arc furnace (EAF)	
	Cowper	
	Rotary kiln	
	Reverberatory	
	Other (please specify)	
Temperature in Furnace	Main furnace (°C)	
	Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	

	Other (please specify)	
	None	[]
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues	Disposal of these Residues		
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Type of Plant	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary [√]
	Copper	Primary []	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
Other	Primary []	Secondary []	
Address	Alpha Engineering Ltd SIE Kohat Road, Peshawar		
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Sohail, Proprietor		
Number of Furnaces			
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)		[√]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)		[]
	Continuous (24 hours per day)		[]
Annual Operational/Capacity (per Unit)	t/h (tons per hour)		0.25
	h/d (hours per day)		8
	d/w (days per week)		6
	t/d (tons per day)		2

	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	600
Annual Operation/Capacity (total)	t/h (tons per hour)	0.25
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	2
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	600
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bagfilter Wet scrubber Dry scrubber Lime injection NaOH/alkali injection Active carbon/coke injection Active carbon filter Catalytic converter (SCR) Induced or forced draft fan Other (please specify)	[] [] [] [] [] [] [] [] [] [] []

	None	[]
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Plant Type of	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary [√]
	Copper	Primary []	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
	Other	Primary []	Secondary []
Address		Al-Raza Engineering, SIE Kohat road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)		Mr. Zafar, Owner Phone: 231442	
Number of Furnaces			
Type of Operation	Batch (e.g., 100 kg per batch)	[√]	
	Semi-continuous (e.g., 8 hours per day)	[]	
	Continuous (24 hours per day)	[]	
Annual Operational/Capacity (per Unit)	t/h (tons per hour)		
	h/d (hours per day)		
	d/w (days per week)		
	t/d (tons per day)		

	d/a (days per year) h/a (hours per year) t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bagfilter Wet scrubber Dry scrubber Lime injection NaOH/alkali injection Active carbon/coke injection Active carbon filter Catalytic converter (SCR) Induced or forced draft fan Other (please specify)	[] [] [] [] [] [] [] [] [] [] []

	None	[]
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

	Emission Factor (µg TEQ/t)				
Class	Air	Water	Land	Product	Residues
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Type of Plant	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary [√]
	Copper	Primary []	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
Other	Primary []	Secondary []	
Address		Gandaf Steel Mills Ltd Plot #: 116/1, R-5, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)		Mr. Tariq Mahmood, Factory Manager Phone: 70377, 70378	
Number of Furnaces		2	
Type of Operation		Batch (<i>e.g.</i> , 100 kg per batch)	[]
		Semi-continuous (<i>e.g.</i> , 8 hours per day)	[√]
		Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)		t/h (tons per hour)	0.8125
		h/d (hours per day)	16
		d/w (days per week)	6
		t/d (tons per day)	13

	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	3900
Annual Operation/Capacity (total)	t/h (tons per hour)	0.8125
	h/d (hours per day)	16
	d/w (days per week)	6
	t/d (tons per day)	13
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	3900
Type of Furnace	Blast furnace	
	Induction furnace	
	Electric arc furnace (EAF)	2
	Cowper	
	Rotary kiln	
	Reverberatory	
	Other (please specify)	
Temperature in Furnace	Main furnace (°C)	1600
	Second chamber/afterburner (°C)	
Primary Fuel	Type Electricity	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
	Other (please specify)	

	None	[√]
Heat Recovery System	Yes []	No [√]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []
	315		

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Plant Type of	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary [√]
	Copper	Primary []	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
Other	Primary []	Secondary []	
Address		Nomee Steel Re-Rolling Mills IE Hattar, Haripur	
Contact (Name, position, phone and fax numbers, e-mail)		Mr. Mohammad Dawood, Chief Executive Phone: 6170251-2, Fax: 617182	
Number of Furnaces			
Type of Operation	Batch (e.g., 100 kg per batch)	[√]	
	Semi-continuous (e.g., 8 hours per day)	[]	
	Continuous (24 hours per day)	[]	
Annual Operational/Capacity (per Unit)	t/h (tons per hour)		2.25
	h/d (hours per day)		8
	d/w (days per week)		6
	t/d (tons per day)		18

	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	5400
Annual Operation/Capacity (total)	t/h (tons per hour)	2.25
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	18
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	5400
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bagfilter Wet scrubber Dry scrubber Lime injection NaOH/alkali injection Active carbon/coke injection Active carbon filter Catalytic converter (SCR) Induced or forced draft fan Other (please specify)	[] [] [] [] [] [] [] [] [] [] []

	None	[]
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Plant Type of	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary []
	Copper	Primary []	Secondary [√]
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
Other	Primary []	Secondary []	
Address		Nauman Engg Ind Plot #: 192-AIE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)		Syed Shah, Onwer Phone: 812398	
Number of Furnaces			
Type of Operation	Batch (e.g., 100 kg per batch)		[√]
	Semi-continuous (e.g., 8 hours per day)		[]
	Continuous (24 hours per day)		[]
Annual Operational/Capacity (per Unit)	t/h (tons per hour)		
	h/d (hours per day)		8
	d/w (days per week)		6

	t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	300 2400
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bagfilter Wet scrubber Dry scrubber Lime injection NaOH/alkali injection Active carbon/coke injection Active carbon filter Catalytic converter (SCR) Induced or forced draft fan	[] [] [] [] [] [] [] [] [] [] []

	Other (please specify)	
	None	[]
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues	Disposal of these Residues		
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Plant Type of	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary []
	Copper	Primary []	Secondary [√]
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
	Other	Primary []	Secondary []
Address		Diamond Weld Rods Pvt Ltd Plot #: 51-52, Phase-III, IE HAttar, Haripur	
Contact (Name, position, phone and fax numbers, e-mail)		Mr. Khalid Zaidi, GM Phone: 617501-2, Fax: 617503	
Number of Furnaces			
Type of Operation	Batch (e.g., 100 kg per batch)		[√]
	Semi-continuous (e.g., 8 hours per day)		[]
	Continuous (24 hours per day)		[]
Annual Operational/Capacity (per Unit)	t/h (tons per hour)		1.25
	h/d (hours per day)		8
	d/w (days per week)		6

	t/d (tons per day)	10
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	3000
Annual Operation/Capacity (total)	t/h (tons per hour)	1.25
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	10
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	3000
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bagfilter Wet scrubber Dry scrubber Lime injection NaOH/alkali injection Active carbon/coke injection Active carbon filter Catalytic converter (SCR) Induced or forced draft fan	[] [] [] [] [] [] [] [] [] [] []

	Other (please specify)		
	None		[]
Heat Recovery System	Yes []	No []	
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []	
Flux of Exit Gases	(m³/h) (dry gas)		

Residues	Disposal of these Residues		
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 2

Ferrous and Non-Ferrous Metal Production

Plant Type of	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary []
	Copper	Primary []	Secondary [√]
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
	Shredder	[]	
Other	Primary []	Secondary []	
Address		Sana Aluminum 58, IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)		Mr. Salahuddin, GM Phone: 812467	
Number of Furnaces			
Type of Operation	Batch (e.g., 100 kg per batch)	[√]	
	Semi-continuous (e.g., 8 hours per day)	[]	
	Continuous (24 hours per day)	[]	
Annual Operational/Capacity (per Unit)	t/h (tons per hour)		
	h/d (hours per day)		8
	d/w (days per week)		6
	t/d (tons per day)		

	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour)	
	h/d (hours per day)	
	d/w (days per week)	
	t/d (tons per day)	
	d/a (days per year)	
	h/a (hours per year)	
	t/a (tons per year)	
Type of Furnace	Blast furnace	
	Induction furnace	
	Electric arc furnace (EAF)	
	Cowper	
	Rotary kiln	
	Reverberatory	
	Other (please specify)	
Temperature in Furnace	Main furnace (°C)	
	Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
	Other (please specify)	

	None	[]
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Annex-L: Production and Use of Chemical and Consumer Goods

Category 7 Production and Use of Chemicals and Consumer Goods
(releases into air and into water)

<p style="text-align: center;">Chemical Industry: Type of Plant</p>	<p>Pulp and paper industry: Pulp</p> <p>Pulp and paper industry: Paper (primary or recycling)</p> <p>Pulp and paper - integrated Organochlorine production</p> <p>Ethylene dichloride</p> <p>PVC</p> <p>Pesticides (PCP, 2,4,5-T, 2,4-D)</p> <p>Production of chlorine gas (graphite electrodes)</p> <p>Petroleum industry refineries</p>	<p style="text-align: center;">[]</p> <p style="text-align: center;">[]</p> <p style="text-align: center;">[]</p> <p style="text-align: center;">[]</p> <p style="text-align: center;">[]</p> <p style="text-align: center;">[]</p> <p style="text-align: center;">[]</p> <p style="text-align: center;">[]</p>
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Bismillah Corporation, Plot No., 67-A, SIE Kohat Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Sarfaraz, Owner Tel: 091-231200	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Silica Sand	240 t/a
	Soda Ash	240 t/a
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Sodium Silicate	480 t/a
Type of Process	Fixed-bed	[]
	Fluidized bed	[]
	Other	[<input checked="" type="checkbox"/>]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]

	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.2
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	1.6
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	480
Annual Operation/Capacity (total)	t/h (tons per hour)	0.2
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	1.6
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	480
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		250

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	12
Sludge disposal	Landfill (t/a)	12
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air	Electrostatic precipitator	[]

Pollution Control System (APCS)	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
Other (please specify)		
None	[√]	
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
	Flux of Exit Gases	(m ³ /h) (dry gas)
Residues		Disposal of these Residues
Generation of Bottom Ashes	t/a []	Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste)Water	t/a []	Disposal
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

**Category 7 Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Azmat Polymers Plot #: 185/1, R-10, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Noor Mohammad, Office Manager Phone: 70368, Fax: 70468	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Phenols	300
	Paraformaldehyde	80
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Phenolic Resin	300
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]

Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.125
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	1
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	300
Annual Operation/Capacity (total)	t/h (tons per hour)	0.125
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	1
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	300
Operation/ Production Temperature	(°C)	95-100
Water discharge (L/h, m ³ /a)		150

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	38
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System	Electrostatic precipitator	[]
	Cyclone	[]

(APCS)	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)	1 Boiler Stack	
None	[]	
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

**Category 7 Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
Chemical Industry: Type of Plant	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Dye Chem, Industries Ltd Plot No. 84-B, R-3, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Sher Ali Khan, General Manager Phone: 70301, Fax: 70302	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	H-Acids, SPC, Venyle Sulphur etc	1500
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Textile Dyes	3000
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]

	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.25
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	2
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	3000
Annual Operation/Capacity (total)	t/h (tons per hour)	0.25
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	2
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	3000
Operation/ Production Temperature	(°C)	°C
Water discharge (L/h, m ³ /a)		6250

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[nil]
Sludge generation	t/a (tons per year)	n/a
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution	Electrostatic precipitator	[]

Control System (APCS)	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[<input checked="" type="checkbox"/>]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
Other (please specify)		
None	[]	
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
	Flux of Exit Gases	(m ³ /h) (dry gas)
Residues		Disposal of these Residues
Generation of Bottom Ashes	t/a []	Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste)Water	t/a []	Disposal []
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

Production and Use of Chemicals and Consumer Goods (releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Visionite Pvt Ltd Plot No. 34-A, R-3, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Nadir Khan Durrani, Manager Personnel Phone: 70151 Fax: 70248	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Formaldelhide, Urea, Malamine, Pulp, Color Addition	3600
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Aminoplast Moulding Compound	3000
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	1.25

Operation/Capacity (per Unit)	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	30
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	3000
Annual Operation/Capacity (total)	t/h (tons per hour)	1.25
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	30
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	3000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		750

Water treatment	Settling pond	[<input checked="" type="checkbox"/>]
	Aerated lagoon	[<input type="checkbox"/>]
	Secondary treatment	[<input type="checkbox"/>]
	Tertiary Treatment	[<input type="checkbox"/>]
	Others (please specify)	[<input type="checkbox"/>]
Sludge generation	t/a (tons per year)	nil
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[<input type="checkbox"/>]
	Cyclone	[<input type="checkbox"/>]
	Bag filter	[<input type="checkbox"/>]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	1 Discharge Stack
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

(releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Bilal Chemicals Industries Plot No. 231, R-3, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mumtaz Khan, General Manager Phone: 70231 Fax: 70431	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PVA, VAM, KPS	600
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Poly Venyl Amulsion	1040
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	0.625

Operation/Capacity (per Unit)	h/d (hours per day)	8
	d/w (days per week)	4
	t/d (tons per day)	5
	d/a (days per year)	208
	h/a (hours per year)	1664
	t/a (tons per year)	1040
Annual Operation/Capacity (total)	t/h (tons per hour)	0.625
	h/d (hours per day)	8
	d/w (days per week)	4
	t/d (tons per day)	5
	d/a (days per year)	208
	h/a (hours per year)	1664
	t/a (tons per year)	1040
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		Nil

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	2
Sludge disposal	Landfill (t/a)	2 Sold to Scavengers
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[n/a]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

Production and Use of Chemicals and Consumer Goods (releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Others (Chemical)		[√]
Address	National Dyes and Adhesive Pvt Ltd Plot #: 50, L-3, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Sohail Ahmad, Production Manager Phone: 70928, Fax: 70527	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Gohlanen	12
	Vinyle Acid	50
	Dil Butyle Pends	12
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Wood Glue & PVMicro Textile	120
Type of Process	Fixed-bed	[√]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[√]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.025
	h/d (hours per day)	16

	d/w (days per week)	6
	t/d (tons per day)	0.4
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	120
Annual Operation/Capacity (total)	t/h (tons per hour)	0.025
	h/d (hours per day)	16
	d/w (days per week)	6
	t/d (tons per day)	0.4
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	120
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		150

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	5
Sludge disposal	Landfill (t/a)	5
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	1 Boiler Stack
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Ink Chemicals Industries Plot No. 21, R-1, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Nadeem, Manager Phone: 70540, Fax: 70538	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Pigments, Solvents, Antifoam, Ethyle Glycol	800
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Water Based Flexi Ink	900
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	0.1875

Operation/Capacity (per Unit)	h/d (hours per day)	16
	d/w (days per week)	6
	t/d (tons per day)	3
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	900
Annual Operation/Capacity (total)	t/h (tons per hour)	0.1875
	h/d (hours per day)	16
	d/w (days per week)	6
	t/d (tons per day)	3
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	900
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		nil

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	nil
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	1 Stack
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

(releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Industrial Chemical Plot #: 310-311, R-7, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mohammad Zahid Dar, Manager Phone: 70691, Fax: 7 0310	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Sod; bi chromate	2400
	Sulphuric Acid	2100
	Glucose	480
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Basic Chromium Sulphate	4500
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	0.625

Operation/Capacity (per Unit)	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	15
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	4500
Annual Operation/Capacity (total)	t/h (tons per hour)	0.625
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	15
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	4500
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	150
Sludge disposal	Landfill (t/a)	n/a
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	4 Discharge Stacks
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

(releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
Chemical Industry: Type of Plant	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Feroz Chemicals Plot #: 193, R-7, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mohammad Alam, Manager Phone: 70265	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Aluminum Hydroxide	3600
	Sulphuric Acid	108
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Aluminum Sulphat	2100
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.875
	h/d (hours per day)	8

	d/w (days per week)	6
	t/d (tons per day)	7
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	2100
Annual Operation/Capacity (total)	t/h (tons per hour)	0.875
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	7
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	2100
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m³/a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	3
Sludge disposal	Landfill (t/a)	3 Recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	2 Discharge Stacks
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Sardar Chemicals Plot No 29-B, R-1. Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Shakoor Paracha, General Manager Phone: 70439 Fax: 70741	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Cyanoric Chloride	6000
	H-Acid	3600
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Leather & Textile Dyes	3600
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.5
	h/d (hours per day)	24

	d/w (days per week)	7
	t/d (tons per day)	12
	d/a (days per year)	365
	h/a (hours per year)	8760
	t/a (tons per year)	3600
Annual Operation/Capacity (total)	t/h (tons per hour)	0.5
	h/d (hours per day)	24
	d/w (days per week)	7
	t/d (tons per day)	12
	d/a (days per year)	365
	h/a (hours per year)	8760
	t/a (tons per year)	3600
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		1040

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[nil]
Sludge generation	t/a (tons per year)	nil
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	1 Discharge stack
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
Chemical Industry: Type of Plant	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	M.B. Dyes Chemicals and Silk Plot #: 320/2, Main Road, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Dr. Maqbool Islam, Director Phone: 70220, Fax: 70165	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Ethyl acetate, butyle acetate, vinyle acetate,	5000
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Leather & Textile Chemicals	12000
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]

Annual Operation/Capacity (per Unit)	t/h (tons per hour)	2.5
	h/d (hours per day)	16
	d/w (days per week)	6
	t/d (tons per day)	40
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	12000
Annual Operation/Capacity (total)	t/h (tons per hour)	2.5
	h/d (hours per day)	16
	d/w (days per week)	6
	t/d (tons per day)	40
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	12000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		125

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	0.6
Sludge disposal	Landfill (t/a)	0.6
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System	Electrostatic precipitator	[]
	Cyclone	[]

(APCS)	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)	2 Boiler Stacks	
None	[]	
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

(releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
Chemical Industry: Type of Plant	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Rawal Chemicals Plot #: 26, Phase-III, IE Hattar, Haripur	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Shaukat Farooq, Factory Manager Phone: 617213, Fax: 617433	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Sulphur	2700
	Aluminum Hydroxide	100
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Sulphuric Acid	4500
	Aluminum Sulphat (ALUM)	270
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]

Annual Operation/Capacity (per Unit)	t/h (tons per hour)	1.875 & 0.1125
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	15 & 0.9
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	4500 & 270
Annual Operation/Capacity (total)	t/h (tons per hour)	1.875 & 0.1125
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	15 & 0.9
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	4500 & 270
Operation/ Production Temperature	(°C)	900°C
Water discharge (L/h, m ³ /a)		1000

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[n/a]
Sludge generation	t/a (tons per year)	10
Sludge disposal	Landfill (t/a)	10
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System	Electrostatic precipitator	[]
	Cyclone	[]

(APCS)	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None	[n/a]	
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

(releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
Chemical Industry: Type of Plant	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Attock Chemical, Ltd Plot #: 48, Phase I&II, IE Hattar, Haripur	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Irshad Butt (Foreman) Phone: 617249	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Sulphur	3600
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Sulphuric Acid	15000
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	6.25

Operation/Capacity (per Unit)	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	50
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	15000
Annual Operation/Capacity (total)	t/h (tons per hour)	6.25
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	50
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	15000
Operation/ Production Temperature	(°C)	900°C
Water discharge (L/h, m ³ /a)		n/a

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	108
Sludge disposal	Landfill (t/a)	108
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	1 Chimny
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(air and into water)**

(releases into

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[√]
Address	Shafi Chemical Industry Plot #: 2, Main Road, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Saeedullah Khan, Factory Manager Phone: 70696, Fax: 70697	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Pthalic anhydride	2100
	2-ethyle alcohol	4320
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Di-Octyle Pthalate	9000
Type of Process	Fixed-bed	[√]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[√]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	1.25

Operation/Capacity (per Unit)	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	30
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	9000
Annual Operation/Capacity (total)	t/h (tons per hour)	1.25
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	30
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	9000
Operation/ Production Temperature	(°C)	220°C
Water discharge (L/h, m ³ /a)		40

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	3.6
Sludge disposal	Landfill (t/a)	3.6 Sold to Brick Klins
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	1 Boiler Stack
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

(releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Chemical	[√]
Address	Usman Paint and Varnish, Jalo Road, SIE Manshera	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Yusuf Khattak, Zubair	
Capacity: Consumption of Raw Materials (type, quantity = t/a)		70 tin of 20 kg/day
Capacity: Final Product of Raw Materials (type, quantity = t/a)		200 litre/day
Type of Process	Fixed-bed	[√]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[√] 35 tin/batch
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]

Annual Operation/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		Nil

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	60 kg/day
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	Taken by Workers for burning purposes
Type of Air Pollution Control System	Electrostatic precipitator Cyclone	[] []

(APCS)*	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
Other (please specify)		
None	[√]	

Temperature of Gases**	At entry to APCS (°C) []	At exit from APCS (°C) []
------------------------	---------------------------	----------------------------

Flux of Exit Gases	(m ³ /h) (dry gas)	Dry gases
--------------------	-------------------------------	------------------

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a [60 kg/day]	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

* The Workers covers mouth and nose with cloth

** Never measured

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Other (Chemical)	[<input checked="" type="checkbox"/>]
Address	Wah Nobled Acetate Pvt Ltd Plot No. 176, Phase V, IE Hattar, Haripur	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Shamshad ul Haq, Deputy Manager Phone: 617756, Fax: 617756	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Ethyle Alcohol	6600
	Butyle Alcohol	3000
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Acetic Acid	4200
	Ethyle Acetate	3600
	Butyle Acetate	3600
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	4.75

Operation/Capacity (per Unit)	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	38
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	11400
Annual Operation/Capacity (total)	t/h (tons per hour)	4.75
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	38
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	11400
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	n/a
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	2 discharge stacks
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4- D)	[]
	Production of chlorine gas (graphite electrodes)	[]
Petroleum industry refineries	[]	
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Complex Chemicals Pvt Ltd IE Hattar, Haripur	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mohammad Saleem, Factory Manager Phone: 617160 Fax: 617161	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Soya Oil	144
	Pthalic Anhydride	120
	Lithium Hydroxide	0.108
	Glycerin	120
	Turpentine Oil	240
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Alkyds-Resin	600
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]

	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.208
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	1.67
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	600
Annual Operation/Capacity (total)	t/h (tons per hour)	0.208
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	1.67
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	600
Operation/ Production Temperature	(°C)	220°C
Water discharge (L/h, m ³ /a)		N/A
Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	N/A
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify)	
	(t/a)	
Type of Air	Electrostatic precipitator	[]

Pollution Control System (APCS)	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
Other (please specify)	2 Discharge Stacks	
None	[]	
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	
Residues		Disposal of these Residues
Generation of Bottom Ashes	t/a []	Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste)Water	t/a []	Disposal []
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemicals)	[<input checked="" type="checkbox"/>]
Address	Ambar Chemicals Industries Pvt Ltd Plot #: 5, Phase IV, IE Hattar, Haripur	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mohammad Asghar, Accountant Phone: 617518-9	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Sulphur	2100
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Sulphuric Acid	4200
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	1.75

Operation/Capacity (per Unit)	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	14
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	4200
Annual Operation/Capacity (total)	t/h (tons per hour)	1.75
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	14
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	4200
Operation/ Production Temperature	(°C)	900°C
Water discharge (L/h, m ³ /a)		n/a

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	n/a
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	1 discharge chimney
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

(releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Deen Industries Plot #: 63-64, Phase III, IE Hattar, Haripur	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Manzoor Ahmad, Office Assistant Phone: 617359	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Aluminum Hydroxide	1440
	Sulphuric Acid	960
	Water	900
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Aluminum Sulphat (ALUM)	2400
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	1

Operation/Capacity (per Unit)	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	8
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	2400
Annual Operation/Capacity (total)	t/h (tons per hour)	1
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	8
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	2400
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		37.5

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[N/A]
Sludge generation	t/a (tons per year)	48
Sludge disposal	Landfill (t/a)	(Municipal Waste)
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	1 Flu Gas Discharge Stack
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(air and into water)**

(releases into

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[√]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Tipu Enterprises, Plot A-25, SIE Abbottabad
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Wajid Ali, Accountant/ Mr. Abid, Director Phone: 0992-381538	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Scrap Material	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	High Density Pipe	
Type of Process	Fixed-bed	[]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[√]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day) d/w (days per week)	

	t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter Wet scrubber Dry scrubber	[] [] [] [] []

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

* The information were collected from the Accountant of another unit working in the vicinity of the Factory as the unit was closed and no related person was available for clear information

Category 7

**Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

(releases into air and into water)

<p>Chemical Industry: Type of Plant</p>	<p>Pulp and paper industry: Pulp</p> <p>Pulp and paper industry: Paper (primary or recycling)</p> <p>Pulp and paper - integrated</p> <p>Organochlorine production</p> <p>Ethylene dichloride</p> <p>PVC</p> <p>Pesticides (PCP, 2,4,5-T, 2,4-D)</p> <p>Production of chlorine gas (graphite electrodes)</p> <p>Petroleum industry refineries</p>	<p>[]</p> <p>[]</p> <p>[√]</p> <p>[]</p> <p>[]</p> <p>[]</p> <p>[]</p> <p>[]</p>
<p>Address</p>	<p>Olympia Paper and Board Mills, (Pvt) Ltd, Plot No. 27-28, IE Hayatabad, Jamrud, Road, Peshawar</p>	
<p>Contact (Name, position, phone and fax numbers, e-mail)</p>	<p>Mr. Mohammad Daud Khan, General Manager Coordination</p> <p>Tel: 815729, 813799</p> <p>Fax: 813799</p>	
<p>Capacity: Consumption of Raw Materials (type, quantity = t/a)</p>	<p>Wood (board, match sticks)</p> <p>Waste Paper</p> <p>Caustic soda, sodium hypochlorite</p>	<p>8</p> <p>30</p> <p>2</p>
<p>Capacity: Final Product of Raw Materials (type, quantity = t/a)</p>	<p>Paper and Paper Board</p> <p>6000</p>	
<p>Type of Process</p>	<p>Fixed-bed</p> <p>Fluidized bed</p> <p>Other</p>	<p>[√]</p> <p>[]</p> <p>[]</p>
<p>Type of Operation</p>	<p>Batch (e.g., 100 kg per batch)</p> <p>Semi-continuous (e.g., 8 hours per day)</p> <p>Continuous (24 hours per day)</p>	<p>[√]</p> <p>[]</p> <p>[]</p>

Annual Operation/Capacity (per Unit)	t/h (tons per hour)	1
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	20
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	6000
Annual Operation/Capacity (total)	t/h (tons per hour)	1
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	20
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	6000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		31000

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	150
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	150 (taken away by scavengers for burning)
Type of Air Pollution Control System	Electrostatic precipitator Cyclone	[] []

(APCS)	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
Other (please specify)		
None	[√]	
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
	Flux of Exit Gases	(m ³ /h) (dry gas)

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Rubber)	[<input checked="" type="checkbox"/>]
Address	Swat Tyre Retread Pvt Ltd Plot # 57, IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Ibrahim, General Manager Phone: 812462	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Rubber	115
	Chemical	15
	Carbon	65
Capacity: Final Product of Raw Materials (type, quantity = n/a)	Tyre	60000
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	n/h (nos per hour)	8.33

Operation/Capacity (per Unit)	h/d (hours per day)	24
	d/w (days per week)	6
	n/d (nos per day)	200
	d/a (days per year)	300
	h/a (hours per year)	7200
	n/a (nos per year)	60000
Annual Operation/Capacity (total)	n/h (nos per hour)	8.33
	h/d (hours per day)	24
	d/w (days per week)	6
	n/d (nos per day)	200
	d/a (days per year)	300
	h/a (hours per year)	7200
	n/a (nos per year)	60000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	20
Sludge disposal	Landfill (t/a)	20 sold for recycling
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[<input checked="" type="checkbox"/>]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Chemical)	[<input checked="" type="checkbox"/>]
Address	Aawan Rubber Works Ltd SIE Kohat Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mohammad Yaqoob, Owner Phone: 231440	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Puncture Rubber Rubber CaCo3	
Capacity: Final Product of Raw Materials (type, quantity = t/a)		
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	

Operation/Capacity (per Unit)	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour)	
	h/d (hours per day)	
	d/w (days per week)	
	t/d (tons per day)	
	d/a (days per year)	
	h/a (hours per year)	
	t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Twin Star Industry Ltd Plot #: 516, IE Jamrud Road, Peshawar
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mir Sohail Hashmat, Director Phone: 812365, Fax: 812835	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Plastic Granules	36
	Color Pigment	1.2
	IPA (ISO Profile Alcohol)	3.6
	Paper	1.4
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Printed Plastic Bag	120
	Printed Plastic Paper	60
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	0.075

Operation/Capacity (per Unit)	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	0.6
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	180
Annual Operation/Capacity (total)	t/h (tons per hour)	0.075
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	0.6
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	180
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		1125

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	0.5
Sludge disposal	Landfill (t/a)	0.5 sold
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[√]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Rubber)	[<input checked="" type="checkbox"/>]
Address	United Rubber Ltd Plot #: 70, IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Asfandyar, Chief Executive, Phone: 814501-3	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Rubber	500
	Carbon	300
	Chemicals	65
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Tyre	150000
	Tube	600000
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	n/h (nos per hour)	20.833 & 83.33
	h/d (hours per day)	24

	d/w (days per week) n/d (nos per day) d/a (days per year) h/a (hours per year) n/a (nos per year)	6 500 & 2000 300 7200 150000 & 600000
Annual Operation/Capacity (total)	n/h (nos per hour) h/d (hours per day) d/w (days per week) n/d (nos per day) d/a (days per year) h/a (hours per year) n/a (nos per year)	20.833 & 83.33 24 6 500 & 2000 300 7200 150000 & 600000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	7.2
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	7.2 Sold for burning
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter	[] [] []

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[√]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Prime Star Industry Pvt Ltd Plot #: 74-A, IE Jamrud Road, Peshawar
Contact (Name, position, phone and fax numbers, e-mail)	Haji Faiz Rasool Khan Phone: 817423-5 fax: 817426	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PVC resin	1800
Capacity: Final Product of Raw Materials (type, quantity = t/a)	PVC Pipe Polythene Sheet PVC Sleeper	1100 500 200
Type of Process	Fixed-bed Fluidized bed Other	[<input checked="" type="checkbox"/>] [] []
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch) Semi-continuous (<i>e.g.</i> , 8 hours per day) Continuous (24 hours per day)	[<input checked="" type="checkbox"/>] [] []
Annual Operation/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day) d/w (days per week)	0.388 16 6

	t/d (tons per day)	6.207
	d/a (days per year)	290
	h/a (hours per year)	4640
	t/a (tons per year)	1800
Annual Operation/Capacity (total)	t/h (tons per hour)	0.388
	h/d (hours per day)	16
	d/w (days per week)	6
	t/d (tons per day)	6.207
	d/a (days per year)	290
	h/a (hours per year)	4640
	t/a (tons per year)	1800
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	0.5
Sludge disposal	Landfill (t/a)	0.5 recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[<input checked="" type="checkbox"/>]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	Ropeman Industry Pvt Ltd Plot #: 14-C, IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Yawar Sharif, MD Phone: 817539	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	HDPE	10
	LLD	6
	PP, Pigment	2
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Thread	12
	Fibre	6
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.125 & 0.0625
	h/d (hours per day)	8
	d/w (days per week)	6

	t/d (tons per day)	1 & 0.5
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	12 & 6
Annual Operation/Capacity (total)	t/h (tons per hour)	0.125 & 0.0625
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	1 & 0.5
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	12 & 6
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	0.16
Sludge disposal	Landfill (t/a)	0.16 sale
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[<input checked="" type="checkbox"/>]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
Petroleum industry refineries	[]	
Address	MKB Enterprises Pvt Ltd Plot #: 86, R-6, IE Jamrud Road, Peshawar	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Zafar Ali Lodhi, Manager Phone: 817401-2	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Propylene	600
	Thread	24
	Pigments	6
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Polypropylene Mat	480
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.08
	h/d (hours per day)	24

	d/w (days per week)	6
	t/d (tons per day)	2
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	480
Annual Operation/Capacity (total)	t/h (tons per hour)	0.08
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	2
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	480
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	63
Sludge disposal	Landfill (t/a)	63 recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	2 stacks
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Royal PVC Pvt Ltd Plot #: 47, R-4, IE Jamrud Road, Peshawar
Contact (Name, position, phone and fax numbers, e-mail)	Syed Safdar Shah, Accounts Manager Phone: 815030, 817509	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PVC Powder Pigments	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	PVC Pipes	300
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.0625
	h/d (hours per day)	16
	d/w (days per week)	6

	t/d (tons per day)	1
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	300
Annual Operation/Capacity (total)	t/h (tons per hour)	0.0625
	h/d (hours per day)	16
	d/w (days per week)	6
	t/d (tons per day)	1
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	300
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		100

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	30
Sludge disposal	Landfill (t/a)	30 recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[<input checked="" type="checkbox"/>]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	MKB Ind Ltd Plot #: 230-231, R-4, Gadoon Amazai, Swabi
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Sardar Hussain, Manager Phone: 70327	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Polypropylene	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Plastic Mats	
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	
	h/d (hours per day)	8
	d/w (days per week)	6

	t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	300 2400
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter Wet scrubber Dry scrubber	[] [] [] [] []

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	Turbela Ind. Ltd Plot #: 30, R-2, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Sultan Mohammad, Manager Phone: 70200	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PVC Resin DOP	1200 500
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Garden Pipe & PVC & Shoes	
Type of Process	Fixed-bed Fluidized bed Other	[<input checked="" type="checkbox"/>] [] []
Type of Operation	Batch (e.g., 100 kg per batch) Semi-continuous (e.g., 8 hours per day) Continuous (24 hours per day)	[<input checked="" type="checkbox"/>] [] []
Annual Operation/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day)	16

	d/w (days per week)	6
	t/d (tons per day)	
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	Sunrise Polyester Pvt LTd Plot #: 115/A, L-5, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Khurshid Khan, Production Incharge Phone: 70480 Fax: 70496	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Polyester Film Aluminum Wire Colors	12
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Metalic	
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	
	h/d (hours per day)	8
	d/w (days per week)	6

	t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	300 2400
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	1
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	1 sold
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter Wet scrubber Dry scrubber	[] [] [] [] []

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Top Star Ind Plot No. 153, Main Road, Gadoon Amazai, Swabi
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Khalid, Production Supervisor Phone/fax: 70531	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PP Grain Dyes Pigment	300 6
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Mat	284
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.039
	h/d (hours per day)	24
	d/w (days per week)	6

	t/d (tons per day)	0.945
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	284
Annual Operation/Capacity (total)	t/h (tons per hour)	0.039
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	0.945
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	284
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		42

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	35
Sludge disposal	Landfill (t/a)	35 Sale
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

**Category 7 Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
Petroleum industry refineries	[]	
Address	Sheraz Plastic Ind Ltd Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Gohar Ali Shah, Manager Phone/Fax: 70308	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PP Pigment	500 100
Capacity: Final Product of Raw Materials (type, quantity = t/a)	PP Woven Mats	210000 mats
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	29.17 mats
	h/d (hours per day)	24
	d/w (days per week)	6

	t/d (tons per day)	700 mats
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	210000 mats
Annual Operation/Capacity (total)	t/h (tons per hour)	29.17 mats
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	700 mats
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	210000 mats
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	24
Sludge disposal	Landfill (t/a)	24 Sale
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Kashmir Polytex Ltd Plot #: 189/3, Main Road, Gadoon Amazai, Swabi
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Samiullah Khan, Dep. Manager (Admn & HR) Phone: 70548, Fax: 70550	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PP Grain Inks Pigment	150
Capacity: Final Product of Raw Materials (type, quantity = t/a)	PP Woven Bags	
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	

Operation/Capacity (per Unit)	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour)	
	h/d (hours per day)	
	d/w (days per week)	
	t/d (tons per day)	
	d/a (days per year)	
	h/a (hours per year)	
	t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	7.5
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	7.5 Sale
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7 Production and Use of Chemicals and Consumer Goods
(releases into air and into water)

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	Crescent Ind Ltd Plot #: 32/2, R-1, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Nauman uddin, Security Supervisor Phone: 70497	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	LDPE M-One Talcum powder	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Jumbolon	75
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.031
	h/d (hours per day)	8
	d/w (days per week)	6

	t/d (tons per day)	0.25
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	75
Annual Operation/Capacity (total)	t/h (tons per hour)	0.031
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	0.25
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	75
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	9
Sludge disposal	Landfill (t/a)	9 Recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Syntron Pvt Ltd Gadoon Amazai, Swabi
Contact (Name, position, phone and fax numbers, e-mail)	Saeed Sultan, Proejct Accountant Phone: 70386, Fax: 70385	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PP Grain Pigment Fillers	3400 34 80
Capacity: Final Product of Raw Materials (type, quantity = t/a)	PP Woven Sach	
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day)	24

	d/w (days per week)	6
	t/d (tons per day)	
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	105
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	105 Sold
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter Wet scrubber	[] [] [] []

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Margalla Packages and Allied Ind Plot No. 185/4, L-9, Gadoon Amazai, Swabi
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Imam Din, Khatab Phone: 70335, 30529	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PPG Pigment	
Capacity: Final Product of Raw Materials (type, quantity = t/a)		
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	
	h/d (hours per day)	24
	d/w (days per week)	6

	t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	300 7200
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter Wet scrubber Dry scrubber	[] [] [] [] []

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	SAB Polymer Ind Pvt Ltd Plot #: 271, Main Road, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Nadeem Butt, Manager Phone: 70367, Fax: 70167	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Polypropylene	42
	Polyethinc, ABS	70
	PVC	80
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Disposable Syringes Intravenues Sets	
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	3458 & 1667 Nos
	h/d (hours per day)	24

	d/w (days per week)	6
	t/d (tons per day)	83000 & 40000 Nos
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	25 & 12 millions
Annual Operation/Capacity (total)	t/h (tons per hour)	3458 & 1667 Nos
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	83000 & 40000 Nos
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	25 & 12 millions
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m³/a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	6
Sludge disposal	Landfill (t/a)	6 sale & recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air	Electrostatic precipitator	[]

Pollution Control System (APCS)	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
Other (please specify)	[]	
None	[]	
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste)Water	t/a []	Disposal []
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Alpha Vinyl Ind Pvt LTd Plot #: 142/5, R4, Gadoon Amazai, Swabi
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Intisar Ahmad, Director Phone: 70543, Fax: 70542	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PVC Powder, Pigment	3000
Capacity: Final Product of Raw Materials (type, quantity = t/a)	PVC Pipes	3000
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.417
	h/d (hours per day)	24
	d/w (days per week)	6

	t/d (tons per day)	10
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	3000
Annual Operation/Capacity (total)	t/h (tons per hour)	0.417
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	10
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	3000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	60
Sludge disposal	Landfill (t/a)	60 Recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	Allied Intl. Pvt Ltd Plot #: 56-57, L-2, Gadoon Amazai, Swabi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Iftikhar ul Hassan, Assistant Manager, Phone: 70257	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Tyre Scrab	480
	MR-2	6
	Furnace Oil, China Clay	132
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Rubber Recbiam	360
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.075
	h/d (hours per day)	16
	d/w (days per week)	6

	t/d (tons per day)	1.2
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	360
Annual Operation/Capacity (total)	t/h (tons per hour)	0.075
	h/d (hours per day)	16
	d/w (days per week)	6
	t/d (tons per day)	1.2
	d/a (days per year)	300
	h/a (hours per year)	4800
	t/a (tons per year)	360
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		30

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	18
Sludge disposal	Landfill (t/a)	18 Sale
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[√]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	National Plastic Industry GT Road, Rahimabad, Swat	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mohammad Yusuf, Owner Fax: 713745	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Pp Grains Pigment	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Hot Pot Sets Cooler	210000 sets 900000 Nos
Type of Process	Fixed-bed	[√]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[√]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	29.16 & 12.5
	h/d (hours per day)	24

	d/w (days per week)	6
	t/d (tons per day)	700 & 300
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	210000 & 90000
Annual Operation/Capacity (total)	t/h (tons per hour)	29.16 & 12.5
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	700 & 300
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	210000 & 90000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	Recycled
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	
Residues		Disposal of these Residues
Generation of Bottom Ashes	t/a []	Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste)Water	t/a []	Disposal []
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	Qismat Plastic Industry Malakand, Mingora Swat	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Ghulab Gul, Labourer Phone: 713067	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Old Shoes DOP	
Capacity: Final Product of Raw Materials (type, quantity = t/a)		108000 Nos
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	45 Nos
	h/d (hours per day)	8
	d/w (days per week)	6

	t/d (tons per day)	360 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	108000 Nos
Annual Operation/Capacity (total)	t/h (tons per hour)	45 Nos
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	360 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	108000 Nos
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Rasool Mohammad Plastic Industry Pnar Mingora, Swat
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mohammad Khan, Owner Phone: 712897	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Old Chappal DOP (Oil)	36
Capacity: Final Product of Raw Materials (type, quantity = t/a)		108000 Nos
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	45 Nos
	h/d (hours per day)	8

	d/w (days per week)	6
	t/d (tons per day)	360 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	108000 Nos
Annual Operation/Capacity (total)	t/h (tons per hour)	45 Nos
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	360 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	108000 Nos
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a)	Recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues		
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Shamuel Plastic Industry Takhta Band Road, Mingora, Swat
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Qavi Khan, Owner Phone: 813627	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Resin Color	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Domestic Products	500
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day)	

	d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter Wet scrubber	[] [] [] []

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[√]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
Petroleum industry refineries	[]	
Address	Riaz Plastic Ind GT Road Manyar Swat	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Ghulam Rasool, Manager Phone: 770129	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PP ABS Crystal	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Domestic Utenciles	900000 Nos
Type of Process	Fixed-bed	[√]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[√]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	125
	h/d (hours per day)	24

	d/w (days per week)	6
	t/d (tons per day)	3000
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	900000
Annual Operation/Capacity (total)	t/h (tons per hour)	125
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	3000
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	900000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	12
Sludge disposal	Landfill (t/a)	12 Recycled + Sold
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
Petroleum industry refineries	[]	
Address	Diamond Plastic Industry Usmanabad, Mingora	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Maqbool Ahmad, Owner Phone: 813941	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Old Shoes DOP (Oil)	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Shoes	540000 Nos
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	225 Nos
	h/d (hours per day)	8
	d/w (days per week)	6

	t/d (tons per day)	1800 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	540000 Nos
Annual Operation/Capacity (total)	t/h (tons per hour)	225 Nos
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	1800 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	540000 Nos
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	12
Sludge disposal	Landfill (t/a)	12 Recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Category 7

**Production and Use of Chemicals and Consumer Goods
(releases into air and into water)**

(releases into air and into water)

<p>Chemical Industry: Type of Plant</p>	<p>Pulp and paper industry: Pulp []</p> <p>Pulp and paper industry: Paper (primary or recycling) []</p> <p>Pulp and paper - integrated []</p> <p>Organochlorine production</p> <p>Ethylene dichloride []</p> <p>PVC [√]</p> <p>Pesticides (PCP, 2,4,5-T, 2,4-D) []</p> <p>Production of chlorine gas (graphite electrodes) []</p> <p>Petroleum industry refineries []</p>	
<p>Address</p>	<p>Pak Plastic Industry Pnar, Mingora Swat</p>	
<p>Contact (Name, position, phone and fax numbers, e-mail)</p>	<p>Mr. Dolat Khan, Owner</p>	
<p>Capacity: Consumption of Raw Materials (type, quantity = t/a)</p>	<p>DOP Resin Old Shoes</p>	
<p>Capacity: Final Product of Raw Materials (type, quantity = t/a)</p>	<p>Plastic Shoes</p>	<p>288000 Nos</p>
<p>Type of Process</p>	<p>Fixed-bed [√]</p> <p>Fluidized bed []</p> <p>Other []</p>	
<p>Type of Operation</p>	<p>Batch (e.g., 100 kg per batch) [√]</p> <p>Semi-continuous (e.g., 8 hours per day) []</p> <p>Continuous (24 hours per day) []</p>	
<p>Annual Operation/Capacity (per Unit)</p>	<p>t/h (tons per hour)</p> <p>h/d (hours per day)</p> <p>d/w (days per week)</p>	<p>120 Nos</p> <p>8</p> <p>6</p>

	t/d (tons per day)	960 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	288000 Nos
Annual Operation/Capacity (total)	t/h (tons per hour)	120 Nos
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	960 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	288000 Nos
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Nawab Plastic Industry Pnar, Mingora, Swat
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Nawab Khan, Owner Phonew\ : 710201	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Resin DOP Old Shoes	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Plastic Shoes	288000 Nos
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	120 Nos
	h/d (hours per day)	8
	d/w (days per week)	6

	t/d (tons per day)	960 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	288000 Nos
Annual Operation/Capacity (total)	t/h (tons per hour)	120 Nos
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	960 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	288000 Nos
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	1.5
Sludge disposal	Landfill (t/a)	1.5 Dumping
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	Sahib Plastic Ind Pnar, Mingora Swat	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Sahib Khan Phone: 710201	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Resin Old Shoes DOP (Oil)	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Plastic Shoes	288000 Nos
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day)	120 Nos 8

	d/w (days per week)	6
	t/d (tons per day)	960 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	288000 Nos
Annual Operation/Capacity (total)	t/h (tons per hour)	120 Nos
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	960 Nos
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	288000 Nos
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	15
Sludge disposal	Landfill (t/a)	15 Recycled
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Others (Rubber)	[<input checked="" type="checkbox"/>]
Address	Allied Rubber Pvt Ltd Takhta Band Road, Mingora	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Gohar Ayub, Director Phone: 813637, Fax: 812523	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Rubber Oil Chemical	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Tyre Tube	100000 Nos 200000 Nos
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	50 & 100 Nos

Operation/Capacity (per Unit)	h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	8 5 400 & 800 Nos 250 2000 100000 & 200000 Nos
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	50 & 100 Nos 8 5 400 & 800 Nos 250 2000 100000 & 200000 Nos
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		100

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System	Electrostatic precipitator	[]
	Cyclone	[]

(APCS)	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify) None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	
Residues		
Generation of Bottom Ashes	t/a []	Disposal of these Residues Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste)Water	t/a []	Disposal []
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[√]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	New Swat Pipe Factory Rahimabad, GT Road, Mingora Swat
Contact (Name, position, phone and fax numbers, e-mail)	Haji Mohammad Amin	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PVC Grain	12
Capacity: Final Product of Raw Materials (type, quantity = t/a)	PVC Grain	12
Type of Process	Fixed-bed	[√]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[√]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.005
	h/d (hours per day)	8
	d/w (days per week)	6

	t/d (tons per day)	0.04
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	12
Annual Operation/Capacity (total)	t/h (tons per hour)	0.005
	h/d (hours per day)	8
	d/w (days per week)	6
	t/d (tons per day)	0.04
	d/a (days per year)	300
	h/a (hours per year)	2400
	t/a (tons per year)	12
Operation/ Production Temperature	(°C)	Not known
Water discharge (L/h, m ³ /a)		Not known

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	3.3 (as solid waste)
Sludge disposal	Landfill (t/a)	3.3 (Crushed / Recycled)
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[√]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Sarina Ind Pvt Ltd Plot # : 32, Phae III, IE Hattar, Haripur
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Mansoor Ahmad, Manager Admn Phone: 617381, Fax: 617413	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	PVC Resin	2400
Capacity: Final Product of Raw Materials (type, quantity = t/a)	PVC Pipes	
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day)	24

	d/w (days per week)	6
	t/d (tons per day)	
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	
Sludge disposal	Landfill (t/a)	
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Taxac Rubber Ind Pvt LTd Plot #: 55/1, Phae III, IE Hattar, Haripur
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Qaiser Imam, Manager Phone: 617640	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Rubber	368
	Sulphur	112
	Calcium, Zinc oxide	90
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Aprin	600000
	Carts	600000
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	250
	h/d (hours per day)	8
	d/w (days per week)	6

	t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	2000 & 2000 300 2400 600000 & 600000
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	250 8 6 2000 & 2000 300 2400 600000 & 600000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	15
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	15 dumped
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter Wet scrubber	[] [] [] []

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
	Address	Tripak Films Ltd Plot #: 78/1, Phase IV, IE Hattar, Haripur
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Imran Quddus , Personnel Manager Phone: 617406-7, Fax: 617054	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Polypropylene	6000
Capacity: Final Product of Raw Materials (type, quantity = t/a)	BOPP Film	6000
Type of Process	Fixed-bed	[<input checked="" type="checkbox"/>]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[<input checked="" type="checkbox"/>]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operation/Capacity (per Unit)	t/h (tons per hour)	0.833
	h/d (hours per day)	24

	d/w (days per week)	6
	t/d (tons per day)	20
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	6000
Annual Operation/Capacity (total)	t/h (tons per hour)	0.833
	h/d (hours per day)	24
	d/w (days per week)	6
	t/d (tons per day)	20
	d/a (days per year)	300
	h/a (hours per year)	7200
	t/a (tons per year)	6000
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		

Water treatment	Settling pond	[]
	Aerated lagoon	[]
	Secondary treatment	[]
	Tertiary Treatment	[]
	Others (please specify)	[]
Sludge generation	t/a (tons per year)	120
Sludge disposal	Landfill (t/a)	120 (sold & recycled)
	Land farming (t/a)	
	On-site (t/a)	
	Incineration (t/a)	
	Others (please specify) (t/a)	
Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[<input checked="" type="checkbox"/>]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
	Petroleum industry refineries	[]
Address	Plastobag Ltd Plot #: 112, IE Hattar, Haripur	
Contact (Name, position, phone and fax numbers, e-mail)	Ph: 617682-3, Fax: 617074	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Polyester Chips HD Polypropylene	900 225
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Pet Bottles	1,800,000 Bottles
Type of Process	Fixed-bed Fluidized bed Other	[<input checked="" type="checkbox"/>] [] []
Type of Operation	Batch (e.g., 100 kg per batch) Semi-continuous (e.g., 8 hours per day) Continuous (24 hours per day)	[<input checked="" type="checkbox"/>] [] []
Annual Operation/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day)	375 bottles 16

	d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	6 6000 bottles 300 4800 1,800,000 bottles
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	375 bottles 16 6 6000 bottles 300 4800 1,800,000 bottles
Operation/ Production Temperature	(°C)	
Water discharge (L/h, m ³ /a)		62

Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	15
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	15 dumped
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter	[] [] []

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation **(to be filled out by the data evaluator)**

	Emission Factor ($\mu\text{g TEQ/t}$)				
Class	Air	Water	Land	Product	Residues
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Punjab

Dioxins & Furans

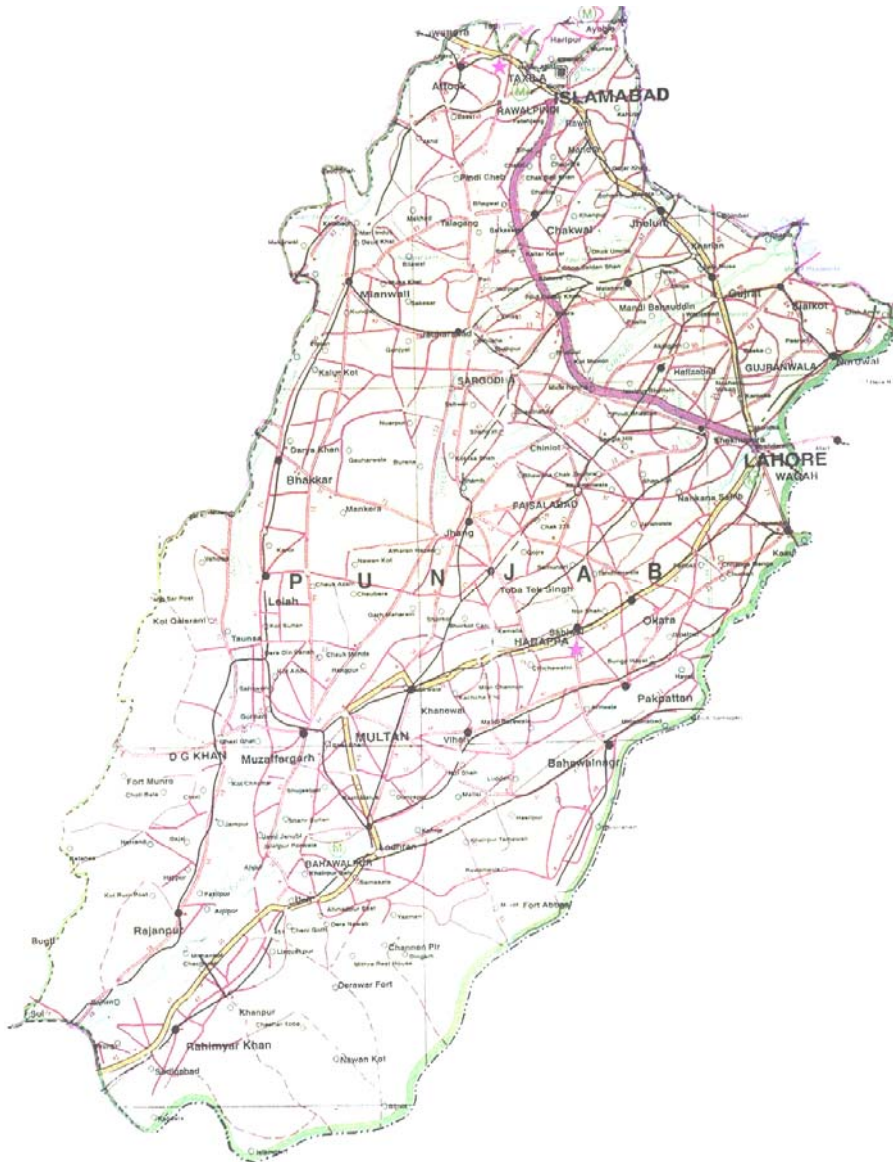


Table 1: Total Number of Hospitals & Beds in Punjab

Type of Health Facility	Number	No. of Beds
Hospitals	298	33724
Dispensaries	1241	1605
Rural Health Centres	294	5764
T.B. Clinics	48	36
Basic Health Units	2427	4486
Sub Health Centres	570	570*
Maternity & Child Health	475	475*
Total	5353	46660

Source Punjab Development Statistics, 2003, Page 196.

Table 2: Incinerator's Installed in Punjab

. No.	City	Hospital	Make	Capacity	Type
.	Multan	Nishter Hospital	Stromangman	100 Kg	Dual Chamber
.	“	Fatima Medical Centre	“	25 Kg	Package Type
.	Lahore	C.M.H	“	25 Kg	Package Type
.	“	Shoukat Khanam Hospital	France	25 Kg	“
.	“	Shalamar Hospital	U.S.A	100 Kg	Dual Chamber
.	Lahore	U.C.H	U.S.A	100 Kg	Dual Chamber
.	Lahore	Sheikh Zaid Hospital			
.	Rawalpindi	Fuji Foundation Hospital	Stromangman	50 Kg	Dual Chamber
.	“	PIUMS			
0.	“	Shifa International	Local	25 Kg	Package
1.	Faisalabad	Civil Hospital	Stromangman	“	Package Type

2.	“	Allied Hospital	Japan	25 Kg	Packing Type
3.	Rabwah	Fazal-e-Omer Hospital	Strongman	25 Kg	Dual Chamber
4.	Narowal	Sahara Trust	Strongman	25 kg	Dual Chamber
5.	Faisalabad	Strongman Premises Small Industrial State	“	10 0 Kg	Dual Chamber

Table 3: Emission Factors and Emissions for Medical Waste

Incineration

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 2: Controlled, batch,no or minimal APCS	7,008	3000	20	21.024	0.140

Medical waste left

=27590-7008=20582 Tons /annum

.....(From I & II)

Table 4: Emission Factors and Emissions for Medical Waste

Incineration (Cat 1)

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1: Uncontrolled batch combustion,no APCS	20,582	40000	200	823.280	4.116

Table 5: Emission Factors and Emissions for Iron Ore Sintering

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1: High Waste Recycling including oil contaminated materials	11,300	20	0.003	0.226	0.000

Table 6: Different Iron and Steel Production Industries And Their Production

S. No.	Type of Industry	No.	Production (Tons/ Year)
1.	Dies & Blocks	35	3359
2.	Dies	59	222
3.	Foundry Products	727	239853
4.	Steel Castings	20	5698
5.	Bulldozers	1	7774
6.	Rerolling/ Casting	65	63460
7.	Ms Products	252	784270
8.	Refractories	5	17070
Total		1164	1121706

Table 7: Emission Factor and Emissions for Steel and Iron Foundries

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1: Cold air cupola ore rotary drum with no gas cleaning	1,121,706	10	0	11.217	0

Table 8: Emission Factor and Emissions for Aluminum Production

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1: Thermal processing of scrap Aluminum, minimal treatment of inputs and simple dust removal.	2,014	150	400	0.302	0.8056

Table 9: Emission Factors and Emissions for Open Burning of Wire

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1. Open burning of Cable	16,425	5000	0	82.125	0

Table 10

WAPDA POWER PLANTS**I. Installed Generating Capacity of Power Stations, National Grid,
WAPDA in Punjab (2002-03)**

<u>Type of Station</u>	<u>Mega Watt</u>
A. Steam	132
i) Faisalabad	130
ii) Multan	1350
iii) Muzaffargarh	640
B. Coal	-
C. Gas	-
D. Combined Cycle/ Gas Turbine	
i) Faisalabad	244
Sub	2496
Total (I):	

II THERMAL (IPPS) & OTHERS

1	Sitara Energy Ltd. 34-km Sheikhpura Road	47
2	Zeashan Energy Ltd Sheikhpura Road	45
3	Ibrahim Energy Ltd Sheikhpura Road	50
4	Kohinoor Power Company Ltd Jaranwala Road	50

5	D.G.Khan Cement Company Ltd.(Power Generation Unit) Mouza Khufli Satai	18
6	Shadiwal Power Station Shadiwal	100
7	Crescent Green Wood Energy (Pvt) Ltd. 10 KM. Pindi Bhattian Sukheke Road Bahuman (Power House)	11
8	Century Power Generation Ltd. 60 KM Multan Road Jumber Khurd	8
9	Chakwal Electric Supply Company Ltd 49- K.M Multan Road	18
10	Genertech Pakistan Ltd. Adda Sarai Chamba 49 KM Multan Road	22
11	Ghazi Power Ltd 46 KM Multan Road Dina Nath	10
12	Gulistan Power Generations Ltd. 62 KM Multan Road Jumber Khurd	5
13	Kohinoor Energy Ltd. 3 KM Roohi Drain Road	120
14	Faufi Power Plant Choopar Hatta Kabirwala	157
15	Roush Pakistan Power Ltd. Abdul Khakim	412
16	Maple Leaf Electric CO. Ltd. Iskandarabad	24
17	A.E.S Pak - Gen (Pvt) Co. P.O Box No. 89, Near Mahmood Kot Adu	360
18	A.E.S Lalpir Ltd. Lalpir Near Mahmoodkot	360
19	Kapco Gas Turbine Power Station	1480
20	Mehmood Power Generation Plant Multan Road	10
21	Thermal Power Complex Chief Engineer Thermal Power Complex	1030
22	Bhanero Energy Ltd, 18- KM Skp. FSD. Road Ferozewatooan	7
23	Crescent Power Tech (Pvt) Ltd. Shiekhupura Faisalabad Road Kotla Kahloan	5
24	D.S. Power Ltd 11. KM Shiekhupura Faisalabad Road	2

25	Dawood Hercules Chemicals Ltd 28-KM Lhr-Skp-Road	8
26	Elahi Electric Company Ltd 13.4 KM SKP Sharqpur Road	2
27	Emco Industries Ltd. 19- Km Lhr Skp Road	5
28	Gulistan Power Generation Ferozwattwan Warberton Road Chunian Industrial Estate	10
29	ICI Power Generation Ltd, 31- KM Lhr - SKP Road	14
30	Idrees Textile Mills Ltd. Warberton	8
31	Monnoo Energy Ltd. Chichokimalian	5
32	Nishat Mills Ltd , 12 KM SKP –FSD- Road	7
33	Olympia Power Limited 13 KM Faisalabad Road	10
34	Saphire Power Generation Ltd. 2 KM Warberton Road	7
35	Shadman Cotton Mills (Pvt) Ltd.	11
36	Zaman Energy Co. Ltd. 26- KM Lhr Skp Road	10
37	Faisal Energy Plant (Old Name Friends Power Plant) Nia Lahore Gojra	3

Sub	Total
(II): 4451	

$$\text{Total} = 2496 + 4451$$

$$=6947 \text{ MW}$$

Production of power generation plants is given in Megawatts (MW) whereas Toolkit uses the unit for energy as TJ (Zera joules) where

$$277.7778 \text{ MW} = 1\text{TJ}$$

or

$$1 \text{ MW} = 0.0036 \text{ TJ}$$

Hence Total Power Generation

$$= 6947 \text{ MW}$$

$$= 6947 \times 0.0036 \text{ TJ}$$

$$= 25.01 \text{ TJ}$$

Fossil Fuels used for all these power plants are coal, heavy fuel oil, light fuel oil and natural gas.

Arrangements have been made by some of the producers to shift from one fuel to another. Due to time constraint individual power plants have not been visited and published data/ statistics of these plants is being used. The type of fuel used by individual plant has not been ascertained through visits. Accordingly the emission factors for fossil fuel based power generation and production of heat/ energy in industry; a conservative default emission factor of class 2 for coal fired power boilers have been used.

Table 11: Emission Factors and Emissions for Power Generation Plants

Classification	Production TJ/a	Emission Factors (ug TEQ/ TJ)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class2. Coal fired power boilers	25.01	10	14	0.000	0.000

Table 12: Domestic Heating, Natural Gas

Classification	Production TJ/a	Emission Factors (ug TEQ/ TJ)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Natural Gas	108,650	1.5	0	0.163	0

Table 13: Emission Factors and Emissions for Domestic Heating, Wood

Classification	Production TJ/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 2 i.e. Virgin wood/ biomass fired stoves	1,964,500	100	20	196.450	39.29

Table 14: Emission Factors and Emissions for Domestic Heating, Kerosene Oil

Classification	Production TJ/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 2 i.e. oil fired stoves	108,640	10	0	1.086	0

Table 15: Emission Factors and Emissions for Domestic Heating, Others

Classification	Production TJ/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 3 i.e. natural gas fired stoves	295,077	1.5	0	0.443	0

Table 16: Emission Factors and Emissions for Cement Production

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1 Wet Kilns ESP Temperature >300°C	4,569,000	5	1	22.845	4.569

Table 17: Emission Factors and Emissions for Lime Production

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1. Cyclone/ no dust control	42,550	10	ND	0.426	ND

Table 18: Emission Factors and Emissions for Brick Kilns

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1. Cyclone/ no dust control	850,460	0.2	ND	0.170	ND

Table 19: Emission Factors and Emission for Glass Production

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1. Cyclone/ no dust Control	148,305	0.2	ND	0.030	ND

Table 20: Emission Factors and Emissions for Ceramics Production

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1. Cyclone/ no dust Control	54,135	0.2	ND	0.011	ND

4.5.1: Two Stroke/ Four Stroke Petrol and Diesel

Engines

* Major refineries capacity in Punjab is as under.

1. Pak Arab Refinery near Multan = 95,000 bbl/ day
2. Attock Refinery near Rawalpindi = 35, 625 bbl/ day

Total: 130,625 bbl/ day

* Total oil consumed in Pakistan = 360, 000 bbl/ day

Assuming that oil consumed in various provinces of Pakistan is proportional to respective population of the Provinces. Population of Punjab is 56% of the total population.

Hence oil consumed in Punjab = $360,000 \times 0.56$ bbl per day

***Source: Pakistan Country Analysis Brief (www.eia.due.gov)**

Table 23: Emission Factors and Emissions for Diesel Engines

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 2. Diesel Engines	6,957,036	0.1	ND	0.696	ND

Table 22: Emission Factors and Emissions for Two Stroke Engines

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 2. Unleaded fuel without Catalyst	389,360	2.5	ND	0.973	ND

Table 22: Emission Factors and Emissions for Two Stroke Engines

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 2. Unleaded fuel without Catalyst	389,360	2.5	ND	0.973	ND

Petrol consumed by 4 stroke engines = 2206374297 kg
 = 2206374 Tons/yr

Class 2 emission factors i.e. unleaded fuel without catalyst (Table 47 – page 111) being used to determine the total emissions.

Table 21: Emission Factors and Emissions for Four Stroke Engines

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 2. Unleaded fuel without Catalyst.	2,206,374	0.1	ND	0.221	ND

Fuel consumed by Pakistan Railway during 2001 (Source: Pakistan Railway) is as under

Coal = 56 Tons

Furnace oil: 3268 Tons

HSD = 128230 Tons

Distributing it on the basis of population (56% for Punjab),

Punjab's share:

Coal = 31 Tons

Furnace Oil=1830 Tons

HSD = 71809 Tons

Escalating at the rate of 20%, the figures for 2003

Coal = 37 Tons

Furnace Oil = 2196 Tons

HSD = 86170 Tons

An emission factor of class 1, coal fired stoves (Table 41, P 97) has been adopted for railway engines using coal.

Table 24: Emission Factor and Emissions from Railway Engines – Coal

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 1. Coal Fired Stoves	37	70	5000	0.003	0.350

An emission factor for heavy fuel and waste oil fired engines (Table 50, page 114) has been used for railway engines consuming furnace oil. These emissions are negligible and hence non-considered.

**Table 25: Emission Factors & Emissions from Railway Engines –
Furnace oil**

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
All types	2,196	4	0	0.009	-

(Class 2 factors for direct engines (i.e. Trucks) are used for railway engines run by diesel (Table 49, Page 112).

These emissions are again very small and hence discarded.

Table 26: Emission Factors & Emissions from Railway Engines – Diesel

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 2. Unleaded fuel without catalyst	86,170	0.1	0	0.009	-

The emissions are too small to be considered.

Table 27: Emissions Factors and Emissions from Biomass Burning

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
1. Forest fires	793,500	5	4	3.968	3.174
3. Agricultural residues burning(in the field) not impacted.	8525925	0.5	10	4.263	85.259

Table: 28 Emission Factors and Emissions for Municipal Solid Waste

Classification	Production T/a	Emission Factors (ug TEQ/ T)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
Class 3. Uncontrolled Domestic Waste Burning	2,436,124	300	600	730.837	1,461.674

Table 29: Emissions Factors and Emissions from Accidental Fires in Vehicles

Types	No. of Accidents	Emission Factors (ug TEQ/ Accident)		Emissions (g TEQ/ a)	
		Air	Residues	Air	Residues
4. Accidental fires in vehicles	2,565	94	18	0.241	0.046

Table 30: Emission Factors and Emissions for Pulp and Paper Industries:

Boilers

Classification	Production t/a (Pulp)	Emission Factors (ug TEQ/ t)		Emissions (g TEQ/ a)	
		Air	Residue/ Sludge	Air	Residue/ Sludge
Black liquor boilers/ burning of sludge and wood	620,508	0.07	1000	0.043	620.508

Table 31: Emission Factors and Emissions for and Paper Industry

Sludges

Classification	Production t/a (Pulp)	Emission Factors (ug TEQ/ t)		Emissions (g TEQ/ a)	
		Water	Residue/ Sludge	Water	Residue/ Sludge
Class 1. Kraft process, old technologies (CL2).	620,508	4.5	4.5	2.792	2.792

Table 32: Emission Factors and Emissions for Pulp and Paper Industry Products

Classification	Production T/a	Emission Factor (ug TEQ/ T)	Emissions (g TEQ/ a)
		Product	Product
Class 1. Kraft pulp and paper from primary fibres, free chlorine bleaching	587,850	8	4.703

Table 33: Emission Factors & Emission from the EDC/VCM/PVC Industry

Classification	Production t/a (Pulp)	Emission Factors (ug TEQ/ t)		Emissions (g TEQ/ a)	
		Water	Residues	Air	Residuee
Class 1. Old Technology, EDC/VCM, PVC	1,023,534	1	3	1.024	3.071

4.7.3: Petroleum Industry

According to Punjab Development Statistics (2003), crude oil produced in Punjab from 24 fields was 8113000 barrels.

1 Barrel = 158.9 Litres

1 Litre of heavy oil = 0.97 kg (Toolkit)

8113000 barrels = 8113000x158.9 litres

= 8113000x158.9x0.97 kg

= (8113000x158.9x0.97) / 1000 Tons

= 1250481 Tons

These values have been inserted in the Excel spread sheet of UNEP Toolkit for future reference as no emission factors were assigned at this time for this type of industrial activity.

Table 34: Emission Factors and Emissions for the Textile Industry

Classification	Production T/a	Emission Factor (ug TEQ/ T)		Emission (g TEQ/ a)	
		Air	Residues	Air	Residues
1. Upper Limit	461,626	0.1	0	0.001	0

Table 35: Emission Factors and Emissions for Leather Industries

Classification	Production T/a	Emission Factor (ug TEQ/ T)		Emission (g TEQ/ a)	
		Air	Residues	Air	Residues
1. Upper Limit	416,907	0.1	0	0.001	0

Table 36: Emission Factors and Emissions for Tobacco Smoking

Classification	Production Nos	Emission Factor (pg TEQ/ unit)		Emission (g TEQ/ a)	
		Air	Residues	Air	Residues
2. cigarettes	12,107,000,000	0.1	0	0.001	0

Table 37: Emission Factors and Emissions for Landfills and Waste Dumps

Classification	Production Litres	Emission Factors pg TEQ/L for wastes release and of leachate released.		Emissions (g TEQ/ a)	
		Air	Water	Air	Water
Class2. Non-hazardous wastes	449,000,000	0	30	-	0.013

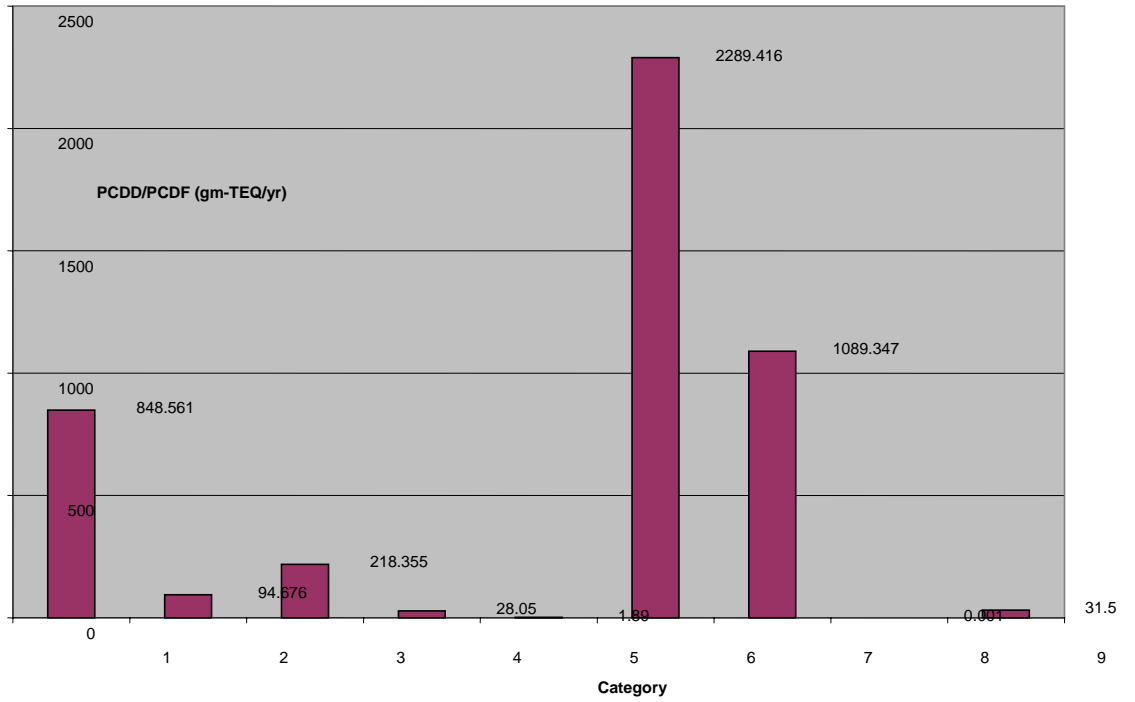
Table 38: Emission Factors and Emissions from Open Water Dumping

Classification	Production Litres/a	Emission Factor (pg TE.Q/ L)	Emission (g TEQ/ a)
		Water	Water
Class1. Mixed domestic and industrial inputs	3.60601E+12	5	18.030

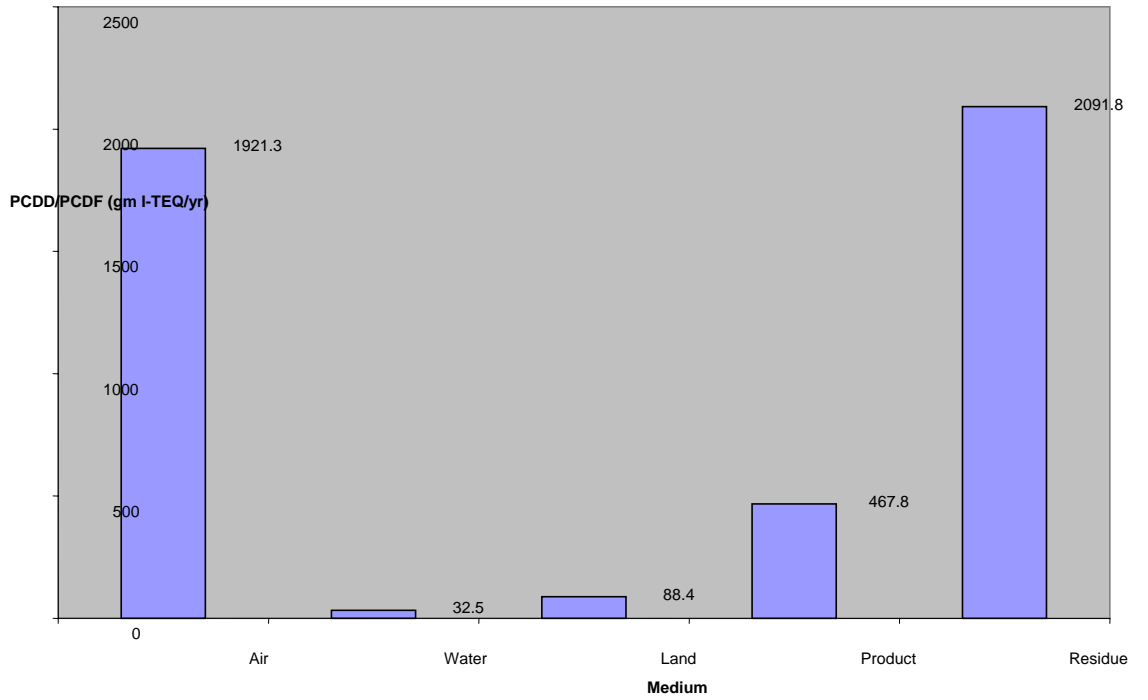
Table 39: Summary of Inventory of Dioxins and Furan in Punjab

#	Source	Emission of Dioxin & Furan gms TEQ/a				
		Air	Water	Land	Residue	Product
1	Waste Incineration	1575.1	-	-	1465.956	-
2	Ferrous & Non-Ferrous Metal Production	93.87	-	-	0.8056	-
3	Power Generation	198.14	-	-	39.29	-
4	Production of Mineral	24.012	-	-	4.569	-
5	Transport	1.901	-	-	0.35	-
6	Uncontrolled Combustion Processes	739.31	-	-	1550.15	-
7	Production and Use of Chemicals and Consumer Goods	3.859	-	-	626.37	467.8
8	Miscellaneous	0.001	-	-	-	-
9	Disposal	-	18.043	-	-	-
10	Identification of Hot Spots	-	-	-	-	-
	Total	2636	18.043		2687	467.8
	Grand Total	5808.84				

Annexure 1.1 Comparison of PCDD/PCDF releases for categories 1-9



Annexure 1.2 Comparison of PCDD/PCDF releases from all media (categories 1-9)



SINDH

Dioxins & Furans

DATA

K.E.S.C.

Furnace oil = 1303174 ton

Heating value 46 MJ/Kg = 46GJ/Ton

Conversion (Toolkit) with heating value for energy units = 1303174 x 46
GJ/Ton

=59946004 GJ/Ton

= 59946.004 TJ/Ton

Oil = 15510 litre

Conversion = 15510 x .00085 = 13.1835 ton

Conversion with heating value for energy units =13.1835 x 46

= 606.441 GJ/Ton

=.606441 TJ/Ton

Light Diesel Oil = 40.470 litre

Conversion (Toolkit) from litre to ton

40.470 x .00085 = .0343995 tons

Conversion (Toolkit) with heating value for energy units =.0343995 tons x 46
GJ/Ton

= 1.582377 GJ/Ton

$$= .001582377 \text{ TJ/Ton}$$

Natural gas = 43770667 cubic metre

Conversion (Toolkit) 1m^3 gas = 0.8 kg

Heating Value 48 MJ/Kg = 48 GJ/Ton

Conversion of gas from m^3 to tons = $43770667 \times .0008 = 35016.533$ Tons

Conversion with Heating value for energy Units = 35016.533×48 GJ/ Ton

$$= 1680793.5 \text{ GJ / Ton}$$

$$= 1680.7935 \text{ TJ /Ton}$$

TAPAL ENERGY

Furnace Oil = 163110 Tons

$$163110 \times 46 = 7503060 \text{ GJ/Ton}$$

$$= 7503.0600 \text{ TJ/Ton.}$$

Oil = 485 Litre

Conversion (Toolkit) from litre = ton

$$485 \times .00085 = .41225 \text{ Tons}$$

Conversion (Toolkit) with heating value for energy units = $.41225 \text{ tons} \times 46$
GJ/Ton

$$= 18.9635 \text{ GJ/Ton}$$

$$= .0189635 \text{ TJ/Ton}$$

Light Diesel oil = 998 litre

Conversion (Toolkit) from litre = ton

$$998 \times .00085 = .8483 \text{ Tons}$$

Conversion (Toolkit) with heating value for energy units = .8483 tons x 46
GJ/Ton

$$= 39.0218 \text{ GJ/Ton}$$

$$= .0390218 \text{ TJ/Ton}$$

GUL AHMED

Furnace oil = 175998 litre

Conversion (Toolkit) from litre = ton

$$175998 \times .00085 = 149.5983 \text{ Ton}$$

Conversion (Toolkit) with heating value for energy units = 149.5983 Tons x 46
GJ/Ton

$$= 6881.5218 \text{ GJ/Ton}$$

$$= 6.8815218 \text{ TJ/Ton}$$

Diesel oil = 41623 litre

Conversion (Toolkit) from litre = ton

$$41623 \times .00085 = 35.37955 \text{ Ton}$$

Conversion (Toolkit) with heating value for energy units = 35.37955 Tons x 46
GJ/Ton

$$= 1627.4593 \text{ GJ/Ton}$$

$$= 1.6274593 \text{ TJ/Ton}$$

DATA

Household connected to gas = 26.1%

Total units of Household = 5170000

Total household connected to gas = 5170000 x 26.1% = 1349370

Total gas consumption for household = 45268 million cubic feet

Conversion (Toolkit) 1m^3 gas = .08

$$45268 \times 10^6 \times .0008 = 36.2144 \times 10^6 \text{ GJ}$$

Heating Value 48 MJ/Kg = 48 GJ/Ton

$$= 36.2144 \times 10^6 \times 48 \text{ GJ/Ton}$$

$$= 1738.2912 \times 10^6 \text{ GJ}$$

$$= 17382912 \times 10^3$$

Average energy required per household = 1.2882242 TJ

Household use Oil = 3.9%

Total units of Household = 5170000

Total household use Oil = 201630

Total Oil consumption for household = 1.5171975 tons

Heating Value 44 MJ/Kg = 44GJ/ Ton

$$= 1.5171975 \times 44 \text{ GJ/ ton}$$

$$= 66.75669 \text{ GJ/Ton}$$

$$= 66.75669 \text{ GJ/Ton} = .06675669 \text{ TJ/Ton}$$

Average energy required per household = 3×10^{-6} TJ

Household use Coal = 0.3%

Total units of Household = 5170000

Total household utilize Coal = 15510

Total Coal consumption for household = 4625.75 MTons

Heating Value 27 MJ/Kg = 27 GJ/Ton

Conversion with Heating value for energy Units

$$4625.75 \times 27 = 124895.25 \text{ GJ/ Ton}$$

$$= 124.89525 \text{ TJ/ Ton}$$

Average energy required per household = .0080525 TJ/Ton

Household use wood = 68.9%

Total units of Household = 5170000

Total household utilize wood = 3562130

Total wood consumption for household = 7000 tons

Conversion with Heating value for energy Units

$$12 \text{ MJ / Kg} = 12 \text{ GJ / Ton}$$

$$70000 \text{ tons} \times 12 \text{ GJ/Ton} = 840000 \text{ GJ/Ton} = 840 \text{ TJ/Ton}$$

Average energy required per household = .0002358 TJ / Ton

Complete Data was collected so that results of the inventory be of quality wise. Independent quality control and quality assurance procedure was adopted for the data gathering step. A complete and detailed database containing all activities potentially related to the release of PCDD/PCDF was established on individual plant for each source. The classification of sources was done on the type of plant, the presence of Air pollution control system.

The estimated release of POPs by-products is 3.911 gTEQ/a release to air .

Excel sheet is also attached with this hyperlink (Right click on this hyperlink and open this link).....

<D:\Dioxin\pttt.xls>

Thanks

Transport

According to the registration statistics of Islamabad from 1980 to 2003, the total number of vehicles registered with Excise and Taxation department in Islamabad is 146870. Out of which 113974 are having 4 stroke petrol engines, 32896 having 2 stroke petrol engines and the remaining 3333 are diesel fed engine vehicles. As the sector is very much complicated and a separate study is needed to calculate the actual quantity of fuel consumed by each category of vehicle. For the calculation of dioxin and furans emissions from transport sector in Islamabad the following assumptions were made to furnish inventory. The table below shows the assumed quantity of annual fuel consumption on average basis for each category of vehicle:

Category of Vehicles	NOs	Assumptions		
		km/day	km/liter	Liter/Annum
Buses / Mini Buses	3333	3900	65	280800
Delivery Van / Pickups	7619	3900	104	175500
Motor Cabs (Taxi)	98899	3900	130	140400
Motor Cabs (Rickshaws)	2706	3250	260	58500
Motor Car/Jeep/Station Wagon	98899	3900	156	127000
Motor Cycle/Scooter	32896	650	260	12700
Other Vehicle	7619	3250	130	127000
Private Carrier Trucks	792	3900	65	280800
Public Carrier Trucks	—	3250	65	234000
Tractors	204	2600	52	234000

As the toolkit requires the type and quantity of fuel consumption per annum, so the daily usage per liter of each category was converted into tons for petrol and diesel according to the UNEP toolkit 2003. While the presence of gasoline fed automobiles were ignored due to non availability of data regarding gasoline fed engines and latest introduction of CNG in the province.

Annex-E: List of Running Industrial Units in Islamabad.

Steel furnaces &/or re-rolling mill industries

Industry name	Plot number	Street #	Sector	Working?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	Employees	Fuel inputs	Water used?	Wastes
Modern Engineering Industries & Re-rolling Mill	005	West Service Rd.	I-9/2	Yes	415 165/ 415 166/ 415 167	418 496	Mohammad Umar/ Mohammad Javad	Manager/ Managing Director		Steel bars	Steel ingots	50	Electricity & furnace oil	Yes	Liquid wastes
Capital Steel Industries	229-230	7	I-9/3	Yes	41305/ 205	417 445 448	Omar Rafique	Owner	2nd contact: Mr. Muhammad Shafique Minhas, Director	Steel bars	Steel billets	00	Natural gas & furnace oil (b/c of load shedding)	Yes	Steel scrap
Potohar Steel Industry	006-7	West Service Rd.	I-9/2	Yes	410 938/ 412 701	418 496	Mr. Muhammad Amjad	Managing Director		Steel ignots	Scrap steel	0	Electricity		
Pak Steel Mills	024-25	West Service Rd.	I-9/2	Yes	411 161/ 411 147/ 0351-7370477		Mian Akram Farid	Owner	Steel furnace and steel re-rolling operation.	Steel ignots	Steel scrap				
Kashmir Steel Mills	093-94	14	I-9/2	No	413 215/ 411 335/ 411 112/ 0351-737 5833	413 039/ 417 256	Nasir Khan	Owner	Steel furnace	Steel ignots	Scrap steel				
Nissan Steel	021-22	West Service Rd.	I-9/2	No	410 935		Fiaz Malik	Owner	Closed since 1997	Re-rolled steel bars					
Siddique Steel Re-rolling	070	14	I-9/2	Yes (in 1993)	413 218 419 135		Mr. Sohail Siddique	Managing Director	No 1998 data	Re-rolled steel bars					
Gandaf Steel Industries	026-27	West Service Rd.	I-9/2	Yes	411 161/ 411 147/ 0351-7370477		Mian Akram Farid	Owner	Steel re-rolling unit	MS bars					
Classic Steel Re-rolling Mill	102	15	-9/2	o (in 1993)	449 664/ 449 665				No 1998 data	MS bars					
S.H. Steel	050-51/	12			411 136/ 842	41	Mohammad			M.S. bars &					

	055- 56		-9/2	es	836	7 552	Naeem Saeed	Managing Director		deformed bars		0	urnace oil, natural gas & electricity	es	
R.K. Steel	050-A	12	-9/2	es	413 215/ 411 335/ 411 112/ 0351- 5833	41 039/ 417 256	M. Nasir Khan	owner		M.S. bars & deformed bars		20	urnace oil & natural gas	es	
Not in use	100-100-A-101	14	-9/2	o (in 1993)					No 1998 data. Moon Enterprises occupied plot in 1993.	M.S. bars & deformed bars					
Imran Munir & Co.	103	15	-9/2	o (in 1993)					No 1998 data. Structure constructed	M.S. bars & deformed bars					
Ittehad Steel	417/ 430		-9/3	es	411 562 411 927	4 145 27	Mr. Khalid Javaid	Chief Executive	Re-rolling mill. Plot 430 not working.	M.S. bars & deformed bars		50	urnace oil, natural gas & electricity	es	
Ittehad Steel	430		-9/3	o	411 562 411 927	4 145 27	Mr. Khalid Javaid	Chief Executive	Also listed on plot 417.	M.S. bars & deformed bars			urnace oil, natural gas & electricity	es	
Khadim Steel	423		-9/3	o	417 583	418 024			Proposed industry, currently Ittehad steel godown. Permit pending	Galvanized iron sheets, CRC sheets & MS Bars					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Shavyl Pipes	001-4/31-A	North Service Rd.	I-9/2	Yes	419 220/415 061	419 220	Malik Amir Daad	General Manager		PVC pipes	PVC resin & other imported fuel	60	Electricity	Yes	Solid wastes
Modern Engineering Industries & Re-rolling Mill	005	West Service Rd.	I-9/2	Yes	415 165/415 166/415 167	418 496	Mohamad Umar/Mohamad Javad	Manager/Managing Director		Steel bars	Steel ingots	150	Electricity & furnace oil	Yes	Liquid wastes
Potohar Steel Industry	006-7	West Service Rd.	I-9/2	Yes	410 938/412 701	418 496	Mr. Muhammad Amjad	Managing Director		Steel ingots	Scrap steel	80	Electricity		
Rawal Steel Industries.	008-9	West Service Rd.	I-9/2	No			Mian Shaukat Masud	Manager	Steel shed constructed, not operating						
Fazal Rehman	010	West Service	I-9/2	No			Mian Shaukat	Manager	Not oper						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Textile Mill		Rd.					Masud		ating						
Not in use	011-12	West Service Rd.	I-9/2	No					Shah Nawaz Industries occupied plot in 1993.						
Mat-Cast Private Limited	013-15	West Service Rd.	I-9/2	Yes	410 770/413 170	410771/410881	Ilyas Aziz Malik	Director	Also called Mumtaz Sons Pvt. Ltd. Steel furnace	Steel ignots.		80	Natural gas & electricity		
Fazal Soap Industries	016-17	West Service Rd.	I-9/2	No			Mr. Mian Shaukat Masud	Manager		Laundry Soap					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Helliburton Ltd	018-20	West Service Rd.	I-9/2	Yes					Oil field services.						
Nissan Steel	21-22	West Service Rd.	-9/2	No	410 935		Fiaz Malik	wner	losed since 1997	e-rolled steel bars					
Al-Hilal Steel Industry	23	West Service Rd.	-9/2	No			Haji Muhammad Aslam	anager	reviously produced steel products						
Pak Steel Mills	24-25	West Service Rd.	-9/2	es	Y 411 161/ 411 147/ 0351 7370477		Mian Akram Farid	wner	teel furnace and steel re-rolling oper	teel ignots	teel scrap				

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									ation .						
Gandaf Steel Industries	26-27	West Service Rd.	W-9/2	Yes	11 161/411 147/0351 7370477		ian Akram Farid	owner	teel re-rolling unit	S bars					
Muslim Commercial Bank Godown	28	West Service Rd.	W-9/2	Yes					odown						
Sui Northern Gas CNG Station	29-30	6 (or 1 Potohar Rd.)	W-9/2	Yes						NG Station					
Mi an Ghulam Mohammad	31	North Service Rd.	N-9/2	Yes	11 171 4		ian Ghulam	owner		lush doors & Timber sale	ood	0	ity	Electric	o N crap wood & saw dust
Pioneer Distributors	32	North Service	N-9/2	No	11 331 4		o manage		or Rent	epsi Distri			ity	Electric	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
		Rd.					r			butor					
AC TA Chemicals	33	0	1 -9/2	N o	2 73 649				aiting for No Obje ction Certif icate befor e oper ation begi ns.						
Fir ex Industries Pvt. Ltd	33	0	N -9/2	Y es	4 11 181/ 413 038 (h)	4 11 288	irfraz Khan	hief Executi ve Officer		olar water & spac e heat ers		0	gas electricity	Natural &	
SP EED-flo Filter Industries	33	0	1 -9/2	Y es	4 40 756/ 292 378/ 427 618	4 27 618	r. Iqtidar Mahmo od Dara	anagin g Directo r		utom obile filters		9	gas electricity	Natural &	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Aafan Enterprises	34-35	01	-9/2	Yes	47 000/448 000	47 788 4	r. Sian	Chief Executive		rodutce tobacco machinery parts	teel, iron & Al		gas electricity	Natural & o	N
Not in use	36	North Service Rd.	-9/2	No					ceramic Craft Islamabad working on plot in 1993 .						
Universal Marble	36-A	North Service Rd.	-9/2	Yes	11 135/419 996		Mohammad Farwad	owner		marble slabs and tiles		0	ity	Electric es	Y
Asi		N		Y				2					Electric		Y

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
an Marble Industries	36-B	orth Service Rd.	-9/2	es			afar	wner		arble slabs and tiles			ity	es	
ent Petroleum Warehouse	37-38	0 1	-9/2	es Y	10 437 4		h. Muhammad Fiaz	anaging Director		are-house					
Sc hlumberger Anadreill	39	0 1	-9/2	es Y	40 799/440 788/411 525	28 191 4	im Orourke	ffice Manager		ent & provide oil equipment & services		5			
r Marble Sta	40-42	0 1	-9/2	es Y	11 121/431 121		aeem Ahmad	anager		arble Slabs & Tiles		2	ity	Electric es	Y arble sludge
w Ne Bagh Marble Industry	42-B	1 1	-9/2	es Y	16 403/428 792		bdul Nasir	wner		arble Slabs & Tiles		1	ity	Electric es	Y arble sludge

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Not in use	42-B	1	1-9/2	No					Marble working on plot in 1993. Structure constructed.	Marble slabs & tiles					
Karachi Auction House	43	1	1-9/2	No											
Sohail Brothers Marble	43-A	1	1-9/2	Yes	11 178 4		Mr. Sohail Babar	owner	closed : Oct. 97/ Plan to reopen: April	Marble Tiles & slabs			Electricity	Electric es	Y

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									98						
Apollo Telecom Pvt. Ltd.	44	1	1-9/2	Yes	40 164/ 440 165/ 440 166	40 168	Syed Amir Raza	General Manager		system integration, telecommunication, internet provider		5	ity	Electric	
New United Marble Industry	45	0	1-9/2	Yes	30 430		Mr. Arif	owner		Marble Tiles			ity	Electric	es Y
Al Kausar Flour Mills	46-48	2	1-9/2	Yes	11162/ 843 609/ 445 427/ 418 805		Mr. Asif/ Mr. Muhammad Akram	anager	econd contact name: Mr. Muh	lour		5	ity	Electric	es Y

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									ammad Akram						
International Polymer Industries	49	10	-9/2	Yes	11 4 529/ 412 807	4 15 494	M. Aslam Bhutta	Managing Director		rubber & plastic components		3	gas electricity	Natural &	
S.H. Steel	50-51/ 055-56	12	-9/2	Yes	11 4 136/ 842 836	4 17 552	Mohammad Naeem Saeed	Managing Director		.S. bars & deformed bars		0	oil, gas electricity	Furnaces & natural gas	Y
R.K. Steel	50-A	12	-9/2	Yes	13 4 215/ 411 335/ 411112/ 0351 7375833	4 13 039/ 417 256	M. Nasir Khan	owner		.S. bars & deformed bars		20	oil & gas	Furnaces & natural gas	Y
Aurengzeb Autos	52-	10	-9/2	Yes	10 4 951/		alika	owner	uto	eigh					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
	54/057-60				449 906		Aurengzeb		shop closed 1992 . Operating a weigh bridge on Plot 60	bridge					
M.C.O	N.I. 58	3	1 -9/2						o 1998 data.	arehouse					
Amish Traders	59	3	1 -9/2		4 48 679/ 440 179					rocessor & stockist - deal in marble & grani					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										te					
Ghulam Mustafa Engineering	61	3	1-9/2	Yes					operating in 1993. No data for 1998	flour mill machinery & equipment					
Not in use	61-A	3	1-9/2	Yes (in 1993)					no 1998 data	plastic shopping bags					
Asko Pipes	62-64	3	1-9/2	No	15 169/413 227	15 169 4	Shaukat Ali Butt	Director		.I. & M.S. pipes			Furnace oil, natural gas & electricity		
Karachi Traders	65-66	3	1-9/2	Yes	13 194/411 189	14 107 4	Maimuddin	owner		aluminum warehouse			Electricity		
Berger Paints	67	0	1-9/2	Yes	11 096 4		azal	store		odow					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
							Abbas	Manager		n					
Lucknow Tobacco Company	67/126-B & C	0	1-9/2	Yes	11 202 4		ia	anager		odown					
Shah Enterprises	68-69	4	1-9/2	No (in 1993)					structure constructed: not working in 1993						
Siddique Steel Re-rolling	70	4	1-9/2	Yes (in 1993)	13 218/419 135		r. Sohail Siddique	Managing Director	o 1998 data	e-rolled steel bars					
Crescent Import Ltd.	71	4	1-9/3	Yes	41 677 4	41 676 4	r. Rizwan Aswan	Managing Director	umber of employees	iddlemen for road			ity	Electric	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									s is contract dependent	construction					
Warehouse	72	4	1-9/2	Yes (in 1993)			Abdul Samad Mian		merican Embassy Warehouse. No 1998 data.						
Muzafer Brothers	73-74	3	1-9/2	Yes (in 1993)					o 1998 data	lastic shopping bags					
Warehouse	75	4	1-9/2	Yes (in 1993)			r. Rafiq Ahmed Bhatti	owner	ease d to American Emb assy. No						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									1998 data.						
Not in use	76	0	1-9/2	No					aissons Engineers (Pvt) Ltd. working on plot in 1993.	VC pipes					
Sabro Air Conditioning	76-A/0	0	1-9/2	Yes	11-888-786/144	10 757/429 025	Sif Siddique	ice President Sales & Marketing		C units & refrigeration equipment		00	gas electricity	Natural &	
Mujahid Soap	79	0	1-9/2	Yes (in)	13 210/		h.	anager o		oap					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
& Chemical Ind. Pvt. Ltd.				1993)	413 235		Muhammad Suleman		1998 data						
Shan Soap & Chemical Industry	80	0	1 -9/2	Yes (in 1993)					1998 data	Soap & chemicals					
En Pointe Technologies Pakistan (Pvt.) Ltd.	81	0	1 -9/2		45 573/ 445 574/ 455 178	4 11 165	Amran Akbar	Executive Accountant							
Continental Biscuits	82	0	1 -9/2	Yes	44 491	4 44 501	Afar Iqbal	Manager		Warehouse					
Oriental Furnishing Company	82	0	1 -9/2	No	4 13 172		M. Saeed	Managing Partner		closed					
Fatma Corp & Altech Enterprises	83	0	1 -9/2	Yes	4 49 070	4 72 068	M. Khalid	Managing Director		closed					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Orient Marble	84	0	1-9/2	Yes	11 110 4		Mohammad Aslam	owner		Marble Tiles			Electricity	Yes	
Ilahie Oil Mills	85	0	1-9/2	Yes	12 519 4					Soap					
AC P Oil Mills (Pvt) Ltd	86-88/432	0	1-9/2	Yes	11 300 4		h. Zia-ud-Din Ahmed	Director		Seed/edible oils & soap		01	Furnace oil, natural gas & electricity		
BMW Service Center	89	0	1-9/2	Yes	31 111/444 855/429 898/444 955 4	46 655 4	Samood Rajput	Manager Accounts		Auto repair workshop		2			
Utility Store	90-91	4	1-9/2	Yes (in 1993)					no 1998 data	warehouse					
Not in use	90-A	4	1-9/2	Yes (in 1993)					no 1998 data. Build						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									ing under construction in 1993.						
Microwave Chinico Industries (Pvt) Ltd.	92	4	1-9/2	Yes (in 1993)					o 1998 data	lastic plates					
Kashmir Steel Mills	93-94	4	1-9/2	No	13 215/411 335/411 112/0351 7375833	13 039/417 256	asir Khan	owner	teel furnace	teel ignots	crap steel				
in use	Not 95-96	4	1-9/2	No					hutte ring material dumped on plots						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Pol ytechnique Industries	97- 098	4	1 -9/2	es Y					o 1998 data	rma ment & vehic le repa ring					
ce Javaid Tariq & Iqbal Saeed CA	Offi of 98	0	1 -9/2	es Y	17 499	4				harte red Acco unta nt office					
nder Motors	Jali 99	0	1 -9/2		11 117	4	r. Ghulam Moham mad	anager		uto work shop					
in use	Not 00- 100- A- 101	4	1 -9/2	o 1993) N (in					o 1998 data. Moo n Enter prise	.S. bars & defor med bars					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									s occupied plot in 1993 .						
Classic Steel Re-rolling Mill	02	5	1-9/2	Working (in 1993)	49 664/449 665				o 1998 data	S bars					
Imran Munir & Co.	03	5	1-9/2	Working (in 1993)					o 1998 data. Structure constructed	.S. bars & deformed bars					
Not in use	04	5	1-9/2	Working (in 1993)					o 1998 data. Oil Services Plant occu						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									occupied plot in 1993.						
Not in use	05	5	1-9/2	No (in 1993)					occupied plot in 1993. No 1998 data. Salio a Glass Linings						
Quarel Cassetes Ltd	06	5	1-9/2	Yes (in 1993)					occupied plot in 1993. Operating an office						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									in 1993						
Naem Traders	07-108	51	-9/2	No (in 1993)					no 1998 data. Structure constructed						
RS Engineering Works	09-110	01	-9/2	Yes	16 552 4		Ijaz Shaukat	Owner		Engineering works			Electricity		
Nelum Soap & Chemical	11	01	-9/2	Yes	11 550 119/905	40 631 4	Muhammad Mubeen	General Manager	economic contact name: Mr Abdul Sattar	laundry soap & sodium silicate		0	Furnace oil, natural gas & electricity	Yes	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Kausar Soap Industries	12	5	1-9/2	Yes Y	411 127/ 418 117/ 416 117		Afaq Kausar	Proprietor		Washing soap		0	Natural gas & electricity		
Not in use	13	5	1-9/2	No (in 1993) N					no 1998 data. House constructed						
Iram Marble	14	5	1-9/2	Yes Y	410 948/ 419 931	419 932	Ahboob Ashfaq	Managing Partner		Marble slabs & tiles		5	Electricity	Yes	
DC OG	16-124/ 127-135	5 & 16	1-9/2	Yes Y					Auto repair workshop						
Rehan Chemicals	16-A	5	1-9/2	Yes (in 1993) Y					no 1998	Manufacture					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									data	e sodium silicate					
DC	OG 25/ 136- 137	0	1 -9/2	es Y					ostel						
dani Marble Factory	Ma 26	5	1 -9/2	es Y (in 1993)			h. Muham mad Ikhlaq Hussain			arble slabs & tiles					
Marble	K2 26-A	5	1 -9/2	es Y	4 45 610		h. Muham mad Rizwan	anager							
cknow Tobacco Company	Lu 26-B & C	0	1 -9/2	es Y	4 11 202		ia	anager	Iso on plot 67	odow n					
k Noractor	Pa 26-D	5	1 -9/2	es Y	4 28 562/		mmad	xecutiv		lumin			ity	Electric	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
International Industries Pvt.					444 126		Sarwar/Zia-ur-Rehman	e		um door & window fabrication					
Ars had Marble	37-A	6	1 (or -9/2)	es Y	41 157/ 441 158/ 441 159/ 441 160										
Not in use	37-A	6	1 (or -9/2)	o N					rient Ceramics occupied plot in 1993.						
Badal Marble	37-B	6	1 (or -9/2)	es Y	11 521/ 411 526										
Sa		1		Y	4		I								

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
eed Marble	37-C	6 (or Potohar Rd.)	-9/2	es	11 082		r. Sajid Saeed								
ional Marble	Nat 37-D & 137-E	6 (or Potohar Rd.)	-9/2	es Y	41 537	4	yed Musharaf Hussain	anager	econ d contact name: Mr. Muhammad Jamil	arble slabs		2	ity	Electric es	Y
ghal Marble	Mu 37-F	6 (or Potohar Rd.)	-9/2	es Y	41 534	4									
shmir Marble	Ka 37-G	6 (or Potohar Rd.)	-9/2	es Y	40 930/ 441 930	4	h. Iqbal Hussain								
at Marble	Sw 37-H	6 (or Potohar Rd.)	-9/2	es Y	11 015/ 419 847	15 963									

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Carrier Telephone Industries	38-148/159/161-168/187-189/206-209	& 7 & 2 West Service Rd.	-9/2	es Y	05 230 4	14 859 4									
Fazal Ghee & Vegetable Mills	49-154/169-174	6	-9/3	es Y	10 933/410 509		hawaja Sohail Anjun	General Manager		ghee & cooking oil & soap		00	oil, natural gas, electricity	Furnaces &	es Y
Reliance Grinding Food Factory	55-156	North Service Rd.	-9/3	es Y	11 511 4		h. Muhammad Arif	owner		flour			ity	Electric	
Rehmania Flour & General Mills	57	North Service Rd.	-9/3	es Y	10 941/411 155		hmad Manai	Director		flour		0	ity	Electric	es Y flour dust and solid waste

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
															es
New Capital Dall Mill & Feed	58	North Service Rd.	N-9/3	Yes	11 113/411 173	11 505	Mr. Abdul Waheed	Managing Director/ Owner		Maal	ulses	3	ity	Electric	es Y
TF Pipes	60	2	-9/2	Yes	31 147	31 145	Muhammad Saleem Butt	Managing Director							
Fazal Ghee & Vegetable Mills	69-174	6	-9/3	Yes	10 933/410 509		Mawaja Sohail Anjun	General Manager	Also listed on plots 149-154	Ghee & cooking oil & soap		00	Gas, oil, natural gas, electricity	Furnaces &	es Y
United Mills	Uni Dall 75-176	2	-9/3	Yes	40 932/416 311		Sh. Muhammad Yousaf	owner		Maal	Maal	0	ity	Electric	es Y
United Flour Mill	Uni Flour 77-178	2	-9/3	Yes	19 848/413 200/		Muhammad Tariq	owner	economic	flour		5	ity	Electric	es Y flour dust

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
					262 453				contact name: Khali d Mas ud Bhol a						and solid waste
Rehman Flour Mill	79-180	2	-9/3	Yes	11 704 4		aji Abdul Shakoor/ Khurram Shakoor	owner	ansha Workshop is also located on this plot	flour		0	Electricity	Electric	Yes flour dust and solid wastes
Tel ephone Industry of Pakistan	81-186	2	-9/2	Yes	11 133/ 413 193	10 893 4			o 1998 data	tele phone & communication					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										n equipment					
Tel ecom Foundation	90	2	-9/2	es Y	4 28 544/ 429 877/ 429 878/ 272 669	4 28 512	r. Abdul Latif	anaging Director				03	ity	Electric	
Haf eez Iqbal Oil & Ghee Ind. Pvt. Ltd.	91-192	2	-9/3	o N	4 13 210/ 413 235/ 443 743	4 19 040	afeeq Iqbal/ Sh. Muhammad Akram	anager	lot 191: head office & flour mill Plot 192: flour mill to operate in ~ June 1998	ead office & flour mill					
Uni ted Steel & Die Casting Industry	93-194	2	-9/3	es Y	4 42 323	4 42 323	h. Mohamad Anis	wner		anholes	ron	0	e oil	Furnac o	N crap metal

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Not in use	95	2	-9/3	No					structure constructed: closed	warehouse					
Murgh Brand Spices	96	2	-9/2	Yes	13 015/71015	4	r. Momah had Ashfaq	sole Proprietor		ed chilies grinding & reprocessing		0	ity	Electric es	Y
Crutson	97	2	-9/3	Yes	16 332	4	kram Qureshi	Manager		luminum	God own				
Not in use	98	2	-9/3	No					o established indus						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									try.						
Silver Oil Mills	99-200	2	-9/3	Yes	415 578/411 326	411 503	Aji Farzad Ali	Owner		Seed/vegetable oil		0	Natural gas & oil		
Rose Enterprises Chemical Industries	01	2	-9/3	Yes	45 904/445 905		ftab Iqbal Chaudry	Proprietor	operate on a contract basis	household cleaners	import detergent		Electricity	Yes	
Imperial PVC Pipes/Masud Sons Industries	02-203	2	-9/3	No	11 139/412 809		ehmood Ahmed Sheikh		closed since 1994	VC pipes					
Kohsar Marble	04-205/220	1	-9/3	Yes	11 047/415 602	15 090	r. Munir	Export Manager		Marble slabs & tiles		4	Electricity	Yes	Solid & Liquid
Not in use	10	6	-9/3	No					Building const						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									ructed, closed						
Super Soap/Crown Soap Industries	Su Taj 11	7	-9/3	No	18 080/444 509		ahid Sohail	owner	losed since Feb. 98/ plan to open in future. No set date.	oap			Natural gas & wood when shedding	es	y
Pakistan Alco Aluminum Products	12-213	7	-9/3	Yes	18 591/0300 550815		r. Mohamad Iqbal	Managing Director (Godown)		arehouse			ity	Electric	
vis	Ser 12-213	7	-9/3	Yes	47 140		alikh Amjad Iqbal	Godown Manager		hoe Warehouse			ity	Electric	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes	
No name	14	7	-9/3	No					structure constructed: empty							
Star Marble Industries	15	7	-9/3	Yes	11 172 4	16 741 4	Alian Abdul Khalid	Owner		Marble slabs & tiles		0	Electricity	Electric	Yes	Solid
Ghulab Supreme Tea	16	7	-9/3	Yes	45 179 4				recently opened	Tea Packing						
Muhsraf Marble Industry	16	7	-9/3	Yes	45 179 4		Yahid Zahid Hussain	Owner	vacant plot with Ghulab Supreme Tea	Marble slabs & tiles			Electricity	Electric	Yes	Solid

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Za bros Pakistan Pvt. Limited	17	7	-9/3	No	10 940 4		khtar Masood Malik	Chief Executive	residence on same plot.	ammunition boxes & steel caravans					
Mic ropak Ltd	18	7	-9	Yes	11 524/ 411 634	11 308 4	adeem Shahzad	Manager Finance & Accounts		rinted circuit boards		5	ity	Electric	
Ha q Industries	19	7	-9/3	No			hammad Adil	Manager	new industry will take over plot in April 98						
WR R	19-A	7	-9/3	Yes	49 367/4	49 369 4	hammad Adil	Account		assem por		6	ity	Electric	o N

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Industries					449 368		Mehmood	Officer		ble electronic components & UPS exchanges	ted components				
Not in use	21	6	-9/2	No											
Shmat & Sons	22-224	10	-9/3	Yes	413 195/413 207/0351263123/550907	413 207	Man Ali	Director		ub-assembly unit of electronic parts		8	gas electricity	Natural &	
New Karachi Soap Industries	25	6	-9/3	Yes	413 209/410 944		r. Faisal	Managing Partner		oap		5	gas electricity	Natural & es	Y
Label Pvt Ltd.	26	7	-9/3	Yes	46 226	43 825	rs Amin	wner		arments			ity	Electric	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										sewing					
Shabbir Tiles & Ceramics Ltd	26	7	-9/3	Yes	28 100 4	17 827 4	Auquair Hussain	Assistant Manager		office					
Mehdina Soap & Chemical Industry	27/240-241	7	-9/3	No	15 284/448 755	11 080 4	Mohammad Saud	Managing Director	closed Sept. 98/reopen ~ May 98 (also called Islamabad Soap)	soap chemicals	ash & silica sand	3	gas & oil	Natural furnace	Yes Solid & liquid wastes
HMA Soap Industries	28	7	-9/3	No	13 223 4		Alah-ud-Din	owner	closed since Dec. 97--no plans	soap					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									to open						
Capital Steel Industries	29-230	7	-9/3	Yes	13 205/417 205	45 448	Mar Rafique	Owner	nd contact: Mr. Muhammad Shafique Minhas, Director	teel bars	teel billets	00	Natural gas & furnace oil (b/c of load shedding)	es	Y teel scrap
Islamabad Woolen Mills	31-232 / 245-246	& 8	7 -9/3	Yes	13 186/430 231	45 158	Mohammad Younas Dar	Owner	losed Feb. 98/ Open as of April 98	my blank wools /woolen shawls	aw wool & acrylic /manmade fibres & yarns	5	Natural gas & furnace oil (b/c of load shedding)	es	Y

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes	
Security Packers Warehouse	33	7	-9/3	Yes	11 4 152/428 935	8 25 378	Abdul Latif	Manager		Packing/shipping/custom clearance		0	Electricity	Electric		
National Defense Training	34	6	-9/2	Yes	9 29 0878		Mohammad Naeem	Head of Welding		Welding Training Institute		50	Electricity	Electric		
Indus Soap Factory	35	1	-9/3	Yes	4 14 314/416 880		Ahmed Ashraf	Managing Partner		Washing soap			gas	Natural	es	Y
Aroma Traders	36	6	-9/2		4 12 805											
Malta Soap	37	6	-9/2	Yes	4 11 148		M. Munir	owner		Soap	acid oil	0	Electricity	Electric	es	Y
Not in use	38-	8	-9/3	No					auji							

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
	239								soap working on plot in 1993.						
Medina Soap & Chemical Industry	40-241	7	-9/3	No	15 284/448 755	11 080 4	ohammad Saud	Managing Director	closed Sept. 98/reopen ~ May 98 Also listed on plot 227	soap chemicals	ash & silica sand	3	gas & oil	Natural furnace	Yes Solid & liquid wastes
Sarhad Woolen Mills	42	8	-9/3	Yes	11 327/413 016	15 573/411 327	r. Syed Mansoor Jan	Chief Executive Officer	Isocalled Siraj Gul Mills	woolen Yarn		2	Electricity		

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Do max Engineering (Pvt) Ltd.	43	8	-9/3	Yes	11 107 4	41 492 4	fzal Zaman Ghouri	Managing Director		parabolic antennas & mechanical engineering		5	oil, natural gas, electricity	Furnaces &	Yes
General Pharmaceuticals	44	8	-9/3	No	49 386/449 387	49 387 4	Asir Abas Kazmi	Quality Control Manager	not yet operating, waiting for NOC. expect to operate ~ April 98	pharmaceutical		0	gas, electricity	Natural and	No

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Islamabad Woolen Mills	45-246	7 & 8	-9/3	Yes	13 4 186/231	45 158 4	Mohammad Younas Dar	Owner	closed Feb. 98/ Open as of April 98 Also listed on plots 231-232 /	wool blankets/wool shawls	raw wool & acrylic/manmade fibres & yarns	5	Natural gas & furnace oil (b/c of load shedding)		Yes
Mohammad Yousaf Engineering Company	47	6	-9/2	Yes	13 4 262/311	18 806 4	Mohammed Yousaf	Owner		marble processing machinery	Steel, cast iron, bronze metals	5	Electricity		Yes
Kirch Marble	48	6	-9/2	Yes	13 4 231		Malik Musarat Hussain	Owner		marble Slabs & Tiles	marble	0	Electricity		Yes

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Hina Soap Industry	49	6	-9/2	Yes	12 964 4		r. Shaheed Sadiq	owner		soap	acid oil		gas	Natural	Yes
Bahar Soap	49-A	6	-9/2	Yes	42 828 4		Shaheed Sheikh/Muhammad Naeem Sh.	owners		soap	acid oil			Wood	Yes
Comforta Co	50-252	6	-9/2	Yes	13 242 4	19 608 4	Ahmed-ul-Hassan	Proprietor		how room			ity	Electric	
New Delhi Medicine Laboratories	53	6	-9/2	No	10 974 4		r. Nasim-ul-Haq	Managing Director	structure constructed: closed						
Not in use	53-A	6	-9/2	No					structure const						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									ructed: closed						
Unique Marble	53-B	6	-9/2	Yes	16 391 4		Yusuf Tauqir Ali	Accountant		Marble			Electricity	Yes	Y
Not in use	56-260 & 266-A	8	-9/3	No					Musick Corporation of Pakistan working on plot in 1993.						
New Arschad Flour Mills	62-263	8	-9/3	Yes	11 917/410 917		Sheikh Moham mad Nadeem Akram	Partner		Flour		8	Electricity	Yes	Y

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Autocraft Modern Workshop	64	9	-9/2	Yes	40 780		ajaz Khan	Mechanical Supervisor		Auto repair		5	ity	Electric	
Fin Plastic	65	9	-9/2	Yes	17 497		h. Majeed Ullah	Owner		Manufacture plastic mines	lastic		ity	Electric	o N
Private Residence	66	9	-9/2	No						Private residence					
Sc hlumberger Seaco Inc.	67-268	6	-9/3	Yes	11 100/413 018/413 019/413 020	13 277 4	haya Loudi	anager		Service for oil & gas wells		5	ity	Electric	
EM CO Industries	69-A	6	-9/3	No	50 265		hurshid Anwar	Junior Store	nder const	odow n for			ity	Electric	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Ltd.								Officer	uction	ceramic tiles					
Not in use	69-B	6	-9/3	No					losed steel re-rolling mill.						
7- Up International Beverages Pvt. Ltd.	70-271/281-283	North Service Rd.	N-9/3	Yes	13 957/411 533/411 534	11 539 4	ahfooz Elahi	Director		-Up		54	gas electricity	Natural & es	Y
Not in use	72-273	1	-9/3	No					rescent Marble occupied plot in 1993.						
Cr		1		Y	4								Electric		Y

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
escent Marble	72-274		-9/3	es	18 011		bid Rashid	wner		arble Slabs & Tiles			ity	es	arble sludge
Ani ma Nutritional Products	75	1	-9/3	es Y	41 502 4		ftikhar Ahmad Malik	wner		eterinary medicines	itamins & oxyte tracycline		ity Electric		olid Wastes
Kh awaja Industries	76	1	-9/3	es Y	11 333 4		hawaja Muhammad Munir	wner		pices & vermicillis	heat flour	0	gas electricity	Natural &	
Cit y Marble	77	1	-9/3	es Y	19 209 4		ftab	anaging Director		arble slabs & tiles		6	ity Electric	es Y	olid & Liquid
o International	78-279	1	-9/3	o N			r. Iftikhar Ahmed Khan		acant plots. Partially filled with						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									solid marble wastes.						
7- Up International Beverages Pvt. Ltd.	81-283	North Service Rd.	N-9/3	Yes	413 957/ 411 533/ 411 534	411 539	Ahfooz Elahi	Director	Also listed on plots 270-271	-Up		54	gas electricity	Natural & es	Y
Station Cold Storage	84-285	North Service Rd.	N-9/2	Yes	412 182	417 553	Aziaz Nazir	Managing Director		old Storage Facility			ity	Electric	o N
Esmaile Flour Mill	86-287	North Service Rd.	N-9/2	Yes	414 014/ 444 762/ 418 370		h. Iqbal	owner		flour mill for army			ity	Electric	es Y olid & Liquid
Awlan & Co. National Flour Mills	88-289	North Service Rd.	N-9/3	Yes	4198/ 42112		h. Khallid Randawa	Director		flour			ity	Electric	es Y olid & Liquid

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Warehouse Utility Store	90-A	North Service Rd.	N-9/3	No	52 042 4		Magheer			Warehouse		0			
Not in use	91		3-9/3	No					Structure constructed: vacant			2			
Foundation Eng. Pvt. Ltd	92-294		3-9/3	Yes	18 397 4		Unir Boukhari	Owner	Number of employees is contract dependent	works hop/Boring company					
Not in use	95-298		3-9/3	No					Structure constructed						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									d. Vacant						
Not in use	99	3	-9/3	No					structure present. Possibly residence. No industrial activity						
Islamabad Flour Mills	00-302	3	-9/3	Yes	11 566/0351 4 7357324	11 567	Mr. Babar/ Mr. Majid Abdullah	Manager / Owner		Flour		5	Electricity	Electricity	Yes Solid & Liquid
Pakistan Commercial Company	02-A	3	-9/3	Yes	44 220	4	Abib Ullah	Manager		Textile manufacture	Food	0	Electricity	Electricity	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										uring					
Ra stgar Engineerin g Co. (Pvt) Ltd.	04- 307	3	-9/3	es Y	11 544/ 411 545/ 411 548/ 455 563	4 11 548	r. Imtiaz Ali Rastgar	anagin g Directo r		utom otive parts , iron casti ngs		3	ity Electric	es Y	
Shi lpo Cigarette Factory Ltd.	08- 312	3	-9/3	o N					truct ure const ructe d. Clos ed	igare ttes					
Int erhome Pvt. Ltd.	13- 315/ 326- 328	(& 4)	3 -9/3	es Y	11 555/ 411 556/ 411 565	4 18 627	ariq Mehmo od Sheikh	anager	ffice of a buildi ng const ructi on com pany	nden ting busin ess					
Wi n Pipe	16	4	-9/3	o N	11 930/ 4		h.	wner							

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
					411 573		Waheed-Ud-Din								
Al-Ahli Aluminum Co.	17	4	-9/3	Yes	11 935/413 954	413 970	Mr. Munir Ahmed	Chief Executive		aluminum door & window fabrication		6	gas electricity	Natural &	
Dodhy Latex Pvt. Ltd	18-320	1	-9/3	Yes	11 553	74 327	Hassan Dodhy	owner	lot 318 is vacant	urgic al gloves	atex	8	ity	Electric	
Not in use	21-325	4	-9/3	No					structure constructed. No current activity.						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Int erhome Pvt. Ltd.	26-328	(& 4) 3	-9/3	es Y	11 555/ 411 556/ 411 565	18 627 4	ariq Mehmo od Sheikh	anager	ffice nden of a ting buildi busin ng ess const ructi on com pany . Also on plots 313- 315						
Not in use	28-A	4	-9/3	o N					hafo o Pvt. Ltd worki ng on plot in 1993 . Cho wkid						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									ar's present.						
Jav Ice Factory	29	4	-9/3	es Y	11 530 4		awood Ahmad	Director	seasonal work: operate between May-Sept.	ce	ater		ity	Electric es	Y
Vic tory Pipe	30	4	-9/3	es Y	11 930/ 411 573 4		haudry Waheed-ud-Din	Managing Director		.I. & M.S. Pipes		0	gas electricity	Natural & es	Y
Fa wn Enterprises	31- 332	1	-9/3	es Y	19 068/ 411 921 4	19 067	aeem Qadir	Director		nitwe ar		0	ity	Electric	
Ka shmir Flour & Gen. Mills	33- 334	1	-9/3	es Y	43 487/ 443 497 4		h. Mukhtar Ahmed	owner		lour		5	ity	Electric es	Y lour dust and solid wastes

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Not in use	35-336/ 349-352	& 5	4-9/3	No					hul Bhar occupied plot in 1993 . No current activities.						
British Biscuits	37-340/ 353-356	5	-9/3	No			ariq		losed since 1996 . Plan to reopen April-May 1998	iscuits			Oil generators		
Waqar Flour Mills	41	5	-9/3	Yes	11 925 4		ftikhar Ahmad	owner	econd cont	lour		5	ity Electric	es	Y lour dust and

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									act name: Mr. Muhammad Iqbal						solid wastes
Chaudry Flour Mills	42-343	5	-9/3	Yes	11 753/411 542		h. Gul Bahar	Owner		Flour		0	Electricity	Electricity	Yes Flour dust and solid wastes
Rawal Flour Mills	44	5	-9/3	Yes	12 521		ashid Rehman	Owner		Flour		2	Electricity	Electricity	Yes Flour dust and solid waste
New Al-Hilal Flour Mills Pvt Ltd	45-348	5	-9/3	Yes	18 414/418 415		ehboob Alam	Manager / Owner		Flour		0	Electricity	Electricity	Yes Solid & Liquid
Brit		5		N									Oil		

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
ish Biscuits	53-356		-9/3	o			ariq		losed in 1996 . Reopen May 98? Also listed on plots 337-340	iscuits			generators		
ro Fer Pharmaceu tical Laboratorie s	56-A	5	-9/3	es Y	11 455/ 419 981		r. Mahmo od-ul- Hassan	l anagin g Directo r		harm aceu tical prod ucts			gas electricity	Natural &	
Arif Marble Chips & Powder Factory	57	5	-9/3	es Y			rif Hafeez & Asif Mir	wner							
Me hfil Engineers	58	5	-9/3	o N					losed since Nov.	lour mill mac					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									98	hinery					
Not in use	59-360	5	-9/3	No					structure constructed: closed						
Hashim Thread Mill	61	5	-9/3	Yes	14 002 4		Farooq	owner		hread for carpets		0			
Mian Industries	62	5	-9/3	Yes			Mian Amjad	anager		ails	teel		Electricity		
Par & Mechanical Shop	63	5	-9/3	Yes	47 822 4		Khurram Saeed	anager		anufacture parts out of aluminum &			Electricity		

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										steel					
Yassir Brothers &	63-364	5	-9/3	Yes	444 433		Mr. Hassan	ccountant		teel fabrication of windows & gates			Electricity		
Grand Works	64	5	-9/3	Yes	448 400/ 448 500/ 0351 262 553		Arif Saeed	anaging Partner		all, insulation, floor & industrial tiles & bricks			Electricity	Yes	
Furniture Arcade	65	1	-9/3	Yes	413 822		Dawood Khokar	anager		urniture	ood		Electricity		
UmarSons		5		Yes	411 543		Salah-						Electricity	Yes	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Laboratories	66-367		-9/3				ud-Din	anaging Partner		harmaceutical products		5			
Fine Engineering Services	68	5	-9/3	Yes	411 558	445 157	h. Muhammad Nadeem	anager		oil field equipment & cement industries grinding media	ast iron & MS iron		ity	Electric	
Sundus Flour Mill	69-370	5	-9/3	No			hwaja Abdul Hameed Kadri	anager	nder construction-- Will operate ~ Sept 98						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes	
Sarhad Flour Mills	71-373	5	-9/3	Yes	43 301		h. Hassan	anager		lour		6	ity	Electric	es	Y olid & Liquid
Duty Shop Warehouse	75	1 (or 6 Potohar Rd.)	-9/3	Yes	10 766		ajjad Ahmad	arehouse Manager		arehouse		2				
Not in use	75-A	1 (or 6 Potohar Rd.)	-9/3	No					tructure under construction.							
Not in use	76	1 (or 6 Potohar Rd.)	-9/3	No					& C Engi neeri ng & Pvt. Ltd. worki ng on	ight engi neeri ng & tract or parts						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									plot in 1993						
Not in use	77-378	6 (or 1 Potohar Rd.)	-9/3	No					structure constructed: closed	warehouse					
Aziz Garment Industry	79-380	6 (or 1 Potohar Rd.)	-9/3	Yes	11 911 4	17 123 4	Abul Aziz Khan	owner		leather garments & products	leather		ity	Electric	
VEBRA: vehicle engine and body repair association	81	6 (or 1 Potohar Rd.)	-9/3	Yes	49 981/449 982		Mustafa R Javaid	Managing Director		auto workshop		0	ity	Electric	
Dawn Electric	82-	6 (or 1 Potohar Rd.)	-9/3	Yes	11 570/4		h.	Managing		ires		7	ity	Electric	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Industry	383	Potohar Rd.)			73395/551 829		Iftikhar-ud-Din	g Partner		& cables					
Mi a Traders	84	1 6 (or Potohar Rd.)	-9/3	es Y	4 45 482/ 445 485	4 45 481	r. Ashraf	l anagin g Directo r		ffice: import air condi tioners and their parts		0	ity	Electric	
We atherford Enterra	85- 386	1 6 (or Potohar Rd.)	-9/3	es Y	4 49 542/ 449 543	4 41 214	ulafqar Butt	anager		orks hop to repa ir oil equi pment		5	ity	Electric	
Wil son's Pharmaceu tical	87- 388	1 6 (or Potohar Rd.)	-9/3	es Y	5 84 141	5 84 474	r. Ali Amin			harm aceu tical prod ucts					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Anjak Pvt. Ltd.	89	1 (or 6 Potohar Rd.)	-9/3	Yes	4 29 573	4 29 574	J. Khawaja	Managing Director		tea packaging		2	Electricity		
Saadat Enterprises	90	1 (or 6 Potohar Rd.)	-9/3	No	4 44 390/430 930		Shaukat Hamdani		Currently closed. No opening date given	Arriaje Hall					
Islamabad Engineering	91	1 (or 6 Potohar Rd.)	-9/3	Yes	4 15 057		Isham Ahmad Ilyas			teel gates & windows - only cut and weld	crap steel				
Mirza Engineering & Steel	91	1 (or 6 Potohar Rd.)	-9/3	Yes	4 15 057		Isham Ahmad Abrar			teel gates &	teel				

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Works										wind ows - only cut and weld					
Sh aigan Electric & Engineering Co.	91- 392	6 Potohar Rd.)	1 (or -9/3	es Y	11 761 4	45 438 4	jaz-Ud- Din	eneral Manag er	lot 391d ssible vide d into three . 2k extra indus tries oper ate on plot 391	sssem por 5 ity	mpor 5 ity	Electric			
Um er Brothers	93	6 Potohar Rd.)	1 (or -9/3	es Y	13 952 4		r. Moham mad Umer Abbassi	wner		anuf actur e elect ric poles					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										& accessories for WAPDA					
Toyota Capital Motors	94	16 (or Potohar Rd.)	-9/3	Yes	429 316/445 949/821 618		afdar Awan			Auto sales, service & workshop		0			
American Embassy Warehouse	94-A	16 (or Potohar Rd.)	-9/3	Yes	411 081		r. Ghalib	Manager		godown					
Fazal Industries Pvt. Ltd.	95-396	North Service Rd.	N-9/3	Yes	411 752/411 760/411 900/0351 260100	413 996	Shaukat Masud	Chief Executive		paper sacks for cement		26	gas & electricity	Natural & es	Y
Mehmboob Flour Mills	97-399		-9/3	No	419 979/449 547		amir Jam	Manager		flour		6	ity	Electric es	Y Solid &

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
															liquid
Sihala Flour & General Mills (Pvt) Ltd.	00-403		-9/3	Yes	11 747/411 559/419 069	19 553 4	ariq Sadiq	Director		flour		0	Electricity	Electric	Yes
Pak Construction Company	04		-9/3	No			Mohammad Shafid Butt	owner	not yet operating	allow construction blocks & pipes	equipment		Oil generators	Electric	Yes
Not in use	05-406		-9/3	No	11 912 4		Abdul Majjid	ward	structure for rent. Earlier a Habib Bank car depot/wast						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									e site						
Bami Khan Flour & General Mills	07		-9/3	Yes	429 792/429 793		Hujra Ur Rehman	Accountant		Flour		0	Electricity	Electricity	Yes Liquid & solid
Sajjad Mills	08		-9/3	Yes	411 905/418 222		Alik Parvaiz	Manager		Flour		2	Electricity	Electricity	Yes Liquid & solid
Glasgow Wellcome Pakistan Ltd	09		-9/3	Yes	417 692		Shakht Nazir	Store Manager					Electricity	Electricity	
Salween Marble	10-411		-9/3	No			Shahana		closed since Sept. 1997						
Showeroom	12		-9/3	No	254 299/		Shahana	owner	closed						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
					0351 26169		Asgar								
Nafees Flour Mill	13		-9/3	Yes	4 14 999/ 418 802	4 29 271	ftikhar Ahmad	owner		flour		9	ity	Electric	es Y
Park Building Industries/Rana Marble	14		-9/3	Yes	4 11 749 / 455 499 (h)		ad Akhbar	owner/ Manager		marble slabs & tiles	marble	5	ity	Electric	es Y liquid & solid
Finance Gas Company Limited	15		-9/3	Yes	4 11 549/ 411 552	2 77 882	nam-ul-Haq	Administration Officer							
Capital Marble & Tile	16		-9/3	No			r. Masud Ahmed	Managing Director	closed						
Ittehad Steel	17/ 430		-9/3	Yes	4 11 562/ 411 927	2 74 145	r. Khalid Javaid	Chief Executive	e-rolling mill. Plot 430 not	.S. bars & deformed bars		50	ity	Furnace oil, natural gas & electricity	es Y

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									working.						
Fazal Steel Pvt. Ltd.	18-422		-9/3	Yes	11 560/410 772/410 773	10 771 4	r. Ilyas Aziz Malik	owner		teel ignots, deformed bars	crap steel				
Khadim Steel	23		-9/3	No	17 583	18 024			roposed industry, currently Itteh ad steel godown. Permit pending	alvanized iron sheets, CRC sheets & MS Bars					
Continental Furnishing Co. Pvt.	24		-9/3	No	11 531	4			onda has purc						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
Ltd									base d plot. Auto workshop planned.						
Zia Auctioners	26	1-A	1-9/2	Yes	11 477 4		Afar Satti	owner		uctioning house		2			
Not in use	26	1-A	1-9/2	No					uilding under construction for a soap factory						
Ariana Pvt. Ltd.	27	1-A	1-9/2	Yes	45 246 4		Mohammad Latif Anwar	Engineer		deal and Repa					

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										ir Mining Machinery					
Pakkoo Furniture	28	1-A	1-9/2	Yes	40 354 4		Seewoon	owner		urniture	ood		ity	Electric	
Trifilter Cigarettes	29	1-A	1-9/2	Yes	45 562 4	45 575 4	Shahmad Umair Khan	Managing Director		igarette filters	OW (chemical) & imported paper		ity	Electric	o N
Not in use	29-A	1-A	1-9/2	No					acant plot						
Ittehad Steel	30		-9/3	No	11 562/411 927	74 145 2	r. Khalid Javaid	Chief Executive	Isolated on plot 417.	.S. bars & deformed			e oil, gas & electricity	Furnaces & natural gas	es Y

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										bars					
National General Enterprise	31	1-A	1-9/2	No					vacant						
AC P Oil Mills (Pvt) Ltd	32	0	1-9/2	Yes	11 300 4		h. Zia-ud-Din Ahmed	Director	Also listed on plots 86-88	hee/edible oils & soap		01	e oil, natural gas, electricity	Furnac &	
Not in use	33	1-A	1-9/2	No					vacant plot						
Not in use	34	1-A	1-9/2	No					vacant plot						
Pri me Dairies Ice Cream Ltd.	35	1A	1-9/2	Yes	48 846 4		mir Hameed	anager		odow n/ Cold Storage--Ice cream		5			

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										distributor					
No name	36	1-A	1-9/2	o						structure under construction					
Not in use	37	1-A	1-9/2	o						acant plot					
Not in use	38	1-A	1-9/2	o						acant plot					
Not in use	39	1-A	1-9/2	o						acant plot					
Sa bro Air Conditioning	40-441	0	1-9/2	es	11-888-786/144	10 757/429 025	sif Siddique	ice President Sales & Marketing	iso listed on plots 76- A & 77-78	C units & refrigeration equi		00	gas electricity	Natural &	

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
										ment					
Karachi Printing Service	42	7	-9/2	Yes	40 851 4		Mohammad Anwar Butt	owner	work on a contract basis	poly bags printing		7	Electricity	Electricity	N
Not in use	43	7	-9/2	No					vacant plot						
Not in use	43	7	-9/2	No					structure constructed: closed						
Not in use	44	7	-9/2	No					vacant plot						
Not in use	45	7	-9/2	No					structure constructed						

I-9/2 & I-9/3 Industrial Area Industries

Industry name	Plot number	Street #	Sector	Working ?	Phone #	Fax #	Contact name	Title	Comments	Products	Raw materials	# Employed	Fuel inputs	Water used?	Wastes
									d. Not working.						
Pepsi/Nestle Milk Pak Godown & Distributor	46	7	-9/2	Yes	43 441 0351 713	234/41 446	Altaf H. Zaidi	Manager		Distributor for Pepsi & Nestle			gas electricity	Natural &	
Not in use	47	7	-9/2	No					vacant plot. Khan Garments occupied plot in 1993.						

Annex-D: Details of Hospital Waste Incinerators installed in Islamabad

1. Ferro Pharmaceuticals.
2. General Pharmaceuticals.
3. Glaxo Wellcome Pakistan.
4. Umar Sons Laboratories.
5. Wilsons Pharmaceuticals.
6. Embassy of Japan.
7. Al-Shifa Hospital.

Annex-G: Dioxin and Furans Emission Factors

Category: 1 Waste Incineration

	Emission Factor ($\mu\text{g TEQ/t}$)				
Class	Air	Water	Land	Product	Residues
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Category: 2 Ferrous and non Ferrous Metal Production (Iron & Steel Production).

	Emission Factor ($\mu\text{g TEQ/t}$)				
Class	Air	Water	Land	Product	Residues
	0.1				1.5
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

	290400				4356000
--	--------	--	--	--	---------

Category: 4 Production of Mineral Products (Brick Kilns).

	Emission Factor ($\mu\text{g TEQ/t}$)				
Class	Air	Water	Land	Product	Residues
	2187.5	NA	NA	ND	ND
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues
	10937.5	NA	NA	ND	ND

Category: 6 Uncontrolled Combustion

	Emission Factor ($\mu\text{g TEQ/t}$)				
Class	Air	Water	Land	Product	Residues
	40.5	NA	28	NA	NA
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues
550					

Category: 7 Chemicals and Consumer Goods

	Emission Factor ($\mu\text{g TEQ/t}$)				
Class	Air	Water	Land	Product	Residues
	*	*	*	3500	*
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues
* The TEQ determined is under detection limit	ND	0.00000009	ND		0.00000027

Annex-H: Hospital Waste Questionnaires

Questionnaire 1: Category 1 - Waste Incineration

Type of Plant	Municipal solid waste	[]
	Industrial waste	[]
	Hospital waste	[]
	Light shredder	[]
	Sewage sludge	[]
	Waste wood and waste biomass	[]
	Animal carcasses	[]
Name of Plant		
Location (City/Province)		
Address		
Contact (Name, position, phone and fax numbers, e-mail)		
Number of Furnaces		
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)	t/h (tons per hour)	
	h/d (hours per day)	
	d/w (days per week)	
	t/d (tons per day)	
	d/a (days per year)	
	h/a (hours per year)	
	t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour)	
	h/d (hours per day)	
	d/w (days per week)	
	t/d (tons per day)	
	d/a (days per year)	

		h/a (hours per year)	
		t/a (tons per year)	
Type of Furnace		Mass burn waterwall (grate) Fluidized bed Stoker Rotary kiln Other (please specify)	
Temperature Furnace	in	Main furnace (°C) Afterburner/second chamber (°C)	

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None	[]	
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
		Recirculation	Landfill
Generation of Bottom Ashes	t/a []	[]	[]
Generation of Fly Ashes	t/a []	[]	[]
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation	Landfill
		[]	[]

Annex-I: Mineral Production Questionnaires

Questionnaire 4: Category 4 – Mineral Production

Type of Plant	Cement	[<input checked="" type="checkbox"/>]
	Lime	[<input type="checkbox"/>]
	Brick	[<input type="checkbox"/>]
	Glass	[<input type="checkbox"/>]
	Ceramics	[<input type="checkbox"/>]
	Asphalt mixing	[<input type="checkbox"/>]
Address		
Contact (Name, position, phone and fax numbers, e-mail)		
Number of Furnaces		
Feed Materials (type, quantity = t/a)		
Primary Fuel (type, quantity = t/a)		
Secondary/Alternative Fuel (type, quantity = t/a)		
Type of Process	Dry [<input type="checkbox"/>]	Wet [<input type="checkbox"/>]
Type of Operation	Batch (e.g., 100 kg per batch)	[<input type="checkbox"/>]
	Semi-continuous (e.g., 8 hours per day)	[<input type="checkbox"/>]
	Continuous (24 hours per day)	[<input type="checkbox"/>]
Annual Operational/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year)	

	t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Type of Furnace	Rotary kiln Shaft kiln Tunnel furnace Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)	[]	
None	[]	
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste)Water	t/a []	Disposal []
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Annex-J: Ferrous and Non-Ferrous Metal Production Questionnaires

Questionnaire 2: Category 2 – Ferrous and Non-Ferrous Metal Production Type of Plant	Sinter	[]
	Coke	[]
	Iron and/or steel	Primary [] Secondary []
	Foundry	Primary [] Secondary []

	Copper	Primary []	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc		[]
	Brass/Bronze	Primary []	Secondary []
	Magnesium		[]
	Other non-ferrous metal	Primary []	Secondary []
	Shredder		[]
	Other	Primary []	Secondary []
Address			
Contact (Name, position, phone and fax numbers, e-mail)			
Number of Furnaces			
Type of Operation	Batch (e.g., 100 kg per batch)	[]	
	Semi-continuous (e.g., 8 hours per day)	[]	
	Continuous (24 hours per day)	[]	
Annual Operational/Capacity (per Unit)	t/h (tons per hour)		
	h/d (hours per day)		
	d/w (days per week)		
	t/d (tons per day)		
	d/a (days per year)		
	h/a (hours per year)		
	t/a (tons per year)		
Annual Operation/Capacity (total)	t/h (tons per hour)		
	h/d (hours per day)		
	d/w (days per week)		
	t/d (tons per day)		

	d/a (days per year) h/a (hours per year) t/a (tons per year)	
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	
Primary Fuel	Type	t/a
Secondary/Alternative Fuel	Type	t/a or %

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)	[]	
None	[]	
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

BALUCHISTAN

Dioxins & Furans

1. persist in the environment for a long time before they break down
2. Travel for long distances to all parts of the global, even remote areas thousands of kilometers from the nearest POPs source.
3. Accumulate in the tissue of most living organism, which absorb POPs when they eat food, drink water or breath air and
4. Poison humans and wildlife, causing a wide range of toxic effects.

3. Sources of unintended POPs by-products emission

Following are the main sources of dioxins and furans production and its releases to the environment.

1. Waste Incineration
 - a) Municipal Solid Waste
 - b) Industrial Waste
 - c) Hospital Waste
 - d) Light Shredder
 - e) Sewage Sludge
 - f) Waste Wood and Waste Biomass
 - g) Animal Carcasses
2. Ferrous and Non-ferrous metal production
 - a) Iron ore sintering
 - b) Coke production
 - c) Iron & Steel production & foundries

- d) Copper production
 - e) Aluminum production
 - f) Lead production
 - g) Zinc production
 - h) Brass & Bronze production
 - i) Magnesium production
 - j) Other non-ferrous metal production
 - k) Shredders
 - l) Thermal Wire reclamation
3. Power Generation and Heating / Cooking
- a) Fossil Fuel Power Plants
 - b) Biomass Power Plant
 - c) Landfill / Biogas combustion
 - d) Household heating & cooking with Biomass
 - e) Domestic heating & cooking with fossil fuels
4. Mineral Production
- a) Cement production
 - b) Lime production
 - c) Brick production
 - d) Ceramics production
 - e) Asphalt mixing
 - f) Glass production
- 5. Transport**
- a) 4-strook engines
 - b) 2-strook engines
 - c) Diesel engines
 - d) Heavy Oil fired engines
6. Un control combustion processes
- a) Biomass burning

- b) Waste burning & accidental fires
-
- 7. Production in use of chemical and consumer goods
 - a) Pulp & paper projection
 - b) Chemical Industry
 - c) Petroleum Industry
 - d) Textile production
 - e) Leather refining
-
- 8. Disposal / Landfill

At present the industrial units are functional in the following industrial Estates.

- 1. Quetta
- 2. Hub
- 3. Winder
- 4. Uthal
- 5. Gaddani
- 6. D.M. Jamali (Nasirabad)

As per UNEP toolkit 2003 under Stockholm convention criteria for the emission of unintended POPs by-products (Dioxins & Furans), the categories responsible in the Province of Balochistan are:-

- 1. Waste Incineration (Hospital Waste Incinerator)
- 2. Ferrous and non Ferrous Metal Production (Steel re-rolling Mills & Copper Mining)
- 3. Power Generation and Heating (Power plants and House hold Heating & Cooling)
- 4. Mineral Production (Cement Factories, Brick kilns)
- 5. Transport

6. Uncontrolled Combustion
7. Production and use of chemical and consumer Goods (Oil refinery, chemical)

• Total number of hospitals in Balochistan	85
• Total number of Dispensaries in Balochistan	537
• Total number of Rural Health Centres in Balochistan	69
• Total numbers of Beds	5782
• Waste generated on Daily basis @1.5 Kg/Bed	8673

Copper production

Copper mining is a big industry in Balochistan. Due to the absence of any air pollution control system is a source of Dioxins & Furans. The annual production of the Saindak metal Corporation is 17,500 ton copper, 1.33 ton Gold, 2.5 ton Silver and the by products are:

$$\begin{aligned}
 &245 \text{ ton Pyrite conc./day} \\
 &184 \text{ ton Magnetite conc/} \quad = \quad 67160/a \\
 &1 == \text{ Moly Conc. / Day} = \quad 365 /a
 \end{aligned}$$

The toolkit regarding the mining of Copper Ore is still/silent therefore, the emission factors have been used for the two classes i.e. class 2 and 4 under the Copper Industry. As a result the value of TEQ under class 2 is 0.875, Class 4 is 0.00025. (Annex-C2)

$$\text{Residue: Class2} = 11.025$$

Power Plant:

There are two types of power generation plants in Balochistan

1. Oil fired
2. Gas Fired

As per the UNEP tool kit 2003 the plant type at S. No 1 & 2 falls under class 3 and 4 set out for fossil fuel based generation and production of heat/energy in industry.

The calculated value of TEQ for Oil fired power plant is 0.095 and TEQ for Gas fired plant is 0.011. (Annex-D1, D2) on the basis of one Tera Joule (TJ) = 277.7778 Mega Watt/h

4.3.1 House hold heating & Cooking:

There are 1.018 million house hold in Balochistan under which 204,070 houses in urban areas & 814,191 in the rural areas.(Source Development statistics of Balochistan 2001-02 & 2000-01 Bureaus of Statistics planning & Development Department). As per the same source 30,999 say 31 thousand house hold is natural gas subscribers of the Sui Southern Gas Company Ltd. While the total number of electricity consumers are 353,504 with the consumption of 2552 million Kwh with following breakup:

S.No	Sector	No.of Consumers	Consumption in M.Kwh
1.	Domestic	268,480	339
2.	Commercial	66,513	63
3.	Industrial	2,241	70
4.	Agriculture	16,066	1,992
5.	Others	204	88
	Total	353,504	2,552

(Source: Development statistics of Balochistan 2001-02 & 2000-01 Bureaus of Statistics planning & Development Department)

As 1 cubic meter gas = 0.8 kg
 And 1 kg (heating value) =48 MJ

Therefore $50 \times 0.8 \times 48 = 1,920$ MJ/month/Household
 $= 23,040$ MJ/a/Household
 $= 0.023$ TJ/a/Household

Total number of household subscribed in Balochistan is 31,000 with the total heating & cooking requirement of 713 TJ/a.

Resultantly the TEQ is 0.001 as per UNEP toolkit 2003 class 3 setout for Natural Gas fired stoves.

There are 157,460 vehicles registered in Balochistan (Source: Development Statistics of Balochistan 2001-02 Bureau of Planning and Development Department) (Annex-R), which are further classified as under:

1.	Motor Cycle/Scooter	42247
2.	Passenger Cars, Pickups Jeep, Van etc.	56523
3.	Buses	7166
4.	Truck, Trollers, Crane Tractors etc	49533

Out of the aforementioned figures

- a) 71447 are gasoline drives
- b) 86013 are Diesel drives

Classification of Vehicles:

4 Stroke engine:

i). Leaded	10500
ii). UnLeaded	33800

2 Stroke engine:

i). Leaded	16213
ii). Un Leaded	10934

Diesel Engine: 86013

Production and use of Chemical and Consumer Goods:

There are five major sub categories

- a) pulp & paper production
- b) Chemical Industry
(Chlorophenols, halogenated organics, Cl₂ production, Oxychlorination process)
- c) Petroleum Industry (refineries)
- d) Textile Production
- e) Leather Refining

INDUSTRIAL DIRECTORY BALOCHISTAN LASBELA DISTRICT

S. No	Name and Address of the Unit	Description of Products manufactured.	Phone. No.	Year of Establishment	Investment	Unit of Measurement	Actual Installed Capacity	Man Power	Remarks
	Leather Products								
18	Sabina Leather, Industries, Ltd. 61 Moza Pathra Opp: Bela Engg: Hub	Suitcases and Briefcases & other alliol Plastic Products	2414433 2410819	1982	5.00	Numbers	500	40	
19	Naeelam Shoes Industries, Hub								
20	Dress Leather Ltd. B-73-80, HITE Hub	Leather Garments, Lather Products.		1-1988	2.433	Sq. ft	867545	45	
21	Mehran Coating Ltd. A-55-81, HITE Hub	Coating Work	521564-65 32625 32638	11-1990	16510	M. Tons	3000Pd	9	
22	Vinstar Pakistan Ltd. B-175-176, HITE Hub	Mining Unit Coating Pading	21947/410 745691	10-1989	12981	MTR	5000Pd	35	
23	Balochistan Coating Ltd. HITE Hub	Synthetic Leather	570620 33199 33177						

District Wise UPTO 30-06-2002

Private Trucks				All other Vehicles									
Open Truck	Tankers			Ambu-Lance	Cran	Land Rover	Power Wagon	Pick Up	Road Roller	Truck Trailer	M. Truck	Oil Trailer	D. Truck
	Oil	Gas	Water										
28679	1604	138	372	228	319	83	46	17017	73	2975	1688	136	201
14962	1521	87	50	271	40	70	46	10966	73	163	0	0	0
14184	1415	87	40	267	39	70	44	10356	73	163	0	0	0
279	6	0	0	1	0	0	2	197	0	0	0	0	0
499	0	0	10	3	1	0	0	411	0	0	0	0	0
0	0	0	0	0	0	0	0	2	0	0	0	0	0
2191	44	0	0	8	1	1	0	2764	0	0	164	0	0
791	2	0	0	1	1	0	0	650	0	0	122	0	0
1400	42	0	0	7	0	1	0	2114	0	0	42	0	0
**	**	**	**	**	**	**	**	**	**	**	**	**	**
*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*
1087	25	1	0	15	0	9	0	395	0	0	80	0	0
1049	19	0	0	15	0	9	0	294	0	0	80	0	0
2	3	0	0	0	0	0	0	32	0	0	0	0	0

36	3	1	0	0	0	0	0	69	0	0	0	0	0
**	**	**	***	***	**	***	***	***	***	***	***	***	***
<u>09</u>	<u>4</u>	<u>7</u>	<u>2</u>	<u>1</u>		<u>2</u>	<u>0</u>	<u>266</u>	<u>0</u>	<u>0</u>	<u>37</u>	<u>0</u>	<u>0</u>
46	8	4	1	1		0	0	153	0	0	35	0	0
6			1	0		0	0	56	0	0	0	0	0
			0	0		0	0	4	0	0	0	0	0
6			0	0		2	0	53	0	0	2	0	0
<u>0102</u>	<u>0</u>		<u>320</u>	<u>23</u>	<u>86</u>	<u>1</u>	<u>0</u>	<u>1787</u>	<u>0</u>	<u>2812</u>	<u>1407</u>	<u>136</u>	<u>201</u>
5			0	0		0	0	72	0	0	0	0	0
			0	0		0	0	2	0	0	0	0	0
01	2		0	0		0	0	205	0	0	0	0	0
6			0	4		1	0	60	0	0	0	0	0
			0	0		0	0	2	0	0	0	0	0
940	7		320	19	86	0	0	1446	0	2812	1407	136	201
<u>8</u>			<u>0</u>	<u>1</u>		<u>0</u>	<u>0</u>	<u>839</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

6			0	1				687					
			0					99					
			0					53					

List of Industries Quetta

S. No	Name & Address	Telephone	Nature	Capacity	Investment	Worker
1	M/S. Essa Eng: Works, Almadar Road Quetta	-	Geaser Repairing	1 No./day	Rs.35000	3
2	M/S. Malik Eng: Works Wafa Road Quetta	823319	Engine Repairing	1 -do--	Rs.30000	2
3	M/S. New Akhtar Engg: Works, Wafa Road Quetta	-	Bush Making	-	-	-
4	M/S. Pervez Engg: Works Wafa Road Quetta	-	Transformer	1 -do--	Rs.3.00 lc	2
5	M/S. Yousaf Engg: Works Wafa Road Quetta	-	Reparing of Water Pumps	No Limit	Rs.70000	2
6	M/S. Ibrahim Engg: Works Toghi Road Quetta	839040	Pump Repairing	-do--	Rs.1.00lac	4

7	M/S. Bolan Engg: Works Almdar Road Quetta	665784	Geaser Repairing	-do--	Rs.70000	4
8	M/S. Quetta Auto Engg: Works Toghi Road Quetta	838494	Repares Engine.	-do--	Rs.60000	3
9	M/S. Naeem Engg: Works Quetta	838723	Kharad	-	Rs.1.0 lac	5
10	M/S. Itfaq Engg: Works Gordat Singh Road Quetta	-	=	-	Rs.130000	4
11	M/S. Al-Farooq Engg: Works Shahwakshah Road, Quetta	-	=	-	Rs.100000	6
12	M/S. Babar Engg: Works Mir Ahmed Khan Road Quetta	831575	=	No limit	Rs.120000	4
13	M/S. Umair Engg: Mir Ahmed Khan Road Qta	-	=	-do--	Rs.100000	5
14	M/S. Iqbal Engg: works Mir Ahmed Road Quetta	827127	=	-do--	Rs.100000	3
15	M/S. Talib Nssain Engg: Works Mir Ahmed Khan Road Quetta	-	=	-do--	Rs.90000	2
16	M/S. Sadiq Engg: Works Mir Ahmed Road Quetta	-	=	-do--	Rs.110000	2
17	M/S. Almdar Baker Almadar Road Quetta	663913	Bakers	5 Kg	Rs. 50000	3

18	M/S. Quality Baker & Sweets, Almdar road Quetta	831582	=	Kg 5	Rs.1.0 lac	1
19	M/S. Haidry Bakery Almdar Road Quetta	833105	=	4 =	Rs.60000	3
20	M/S. Pa;ace Bakery Mission Road Quetta	825354	=	7 =	Rs. 4000	5
21	M/S. Imperial Bakery Mission Road Quetta	824542	=	10	Rs.40000	7
22	M/S. Mazgi Bakery Almdar road Quetta	666102	=	5 =	Rs.30000	-
23	M/S. Famous Bakers, Sirki Road Quetta	445583	=	-	Rs. 80000	-
24	M/S. Al-Nasir Bakers, Quetta	-	=	-	-	-
25	M/S. Sadbahar Bakers, New Adda Sirki Road Quetta	448549	=	-	-	4
26	M/S. Subhan Bakers Satellite Town Quetta	440691	=	-	-	1
27	M/S. U.K.D. Bakers –do--	-	=	-	-	1
28	M/S. Fancy Bakers, –do--	450276	=	--	-	1
29	M/S. Dawn Bakers, –do--	451032	=	-	-	2
30	M/S. Danish Bakers, –do--	-	==	-	-	2

31	M/S. Al-Huda, Bakers – do--	444564	=	-	-	2
32	M/S. United Bakers, –do--	447183	=	-	--	2
33	M/S. Zahri Sweets & Bakers, Satelite Town, Qta	447770	=	-	-	3
34	M/S. Akbry Bakers, Hasara Town Kirani Road Quetta	-	=	-	Rs. 1lac	1
35	M/S. Alamdar Bakery Hazara Toqn Kirrani Road Quetta	-	=	-	Rs.40000	1
36	M/S. Clifton Food Industries Mumtaz Toqn Kirrani Road Quetta	443580	=	-	Rs.60000	3
37	M/S. Adil Bakery , Jail Road Quetta	829775	=	-	-	4
38	M/S. Kahkashan Bakery, Chaman Patickm Qta	-	=	-	-	4
39	M/S. Alzaman Bakery, Almo Chowk Chaman Road Quetta	-	=	-	-	3
40	M/S. English Bakers Meconghy Road Quetta	-	=	-	-	3
41	M/S. Afla Bakery Mission road Quetta	-	=	-	-	4

42	M/S. Junction Hotel, Prince Road Quetta	-	Hotel	80 Passanger s	Rs. 200000	3
43	M/S. Al-Abid Hotel, Price Road Quetta	-	=	70 Passanger s	Rs.700000	5
44	M/S. Shalimar Hotel, Abdul Sattar Road Quetta	-	=	80 --do--	Rs.1700000	4
45	M/S. Nayab Hotel, Abdul Sattar Road Quetta	-	=	60--do--	Rs.2000000	3
46	M/S. Hotel Shah fahad, Abdul Sattar Road Quetta	-	=	70--do--	Rs.1800000	4
47	M/S. Lahore Hotel, Abdul Sattar Road Quetta	-	=	90--do--	Rs.4000000	4
48	M/S. Quetta Hotel, Qandhari Bazar Quetta	-	=	12--do--	Rs.-	3
49	M/S. Hotel National city, Qandhari Bazar Quetta	-	=	12--do--	Rs.2.00 lac	4
50	M/S. Al-Sadat Hotel, Qandhari Bazar Quetta	-	=	8--do--	Rs.-	3
51	M/S. Ajmeri Hotel, Qandhari Bazar Quetta	-	=	-	Rs.-	2
52	M/S. Hotel, Al-habib, Chohar Mal road Quetta	-	=	4--do--	Rs.3.00 lac	2
53	M/S. Rabigh Hotel Fatima	-	=	5--do--	Rs.3.50 lac	2

	Jinnah Road Quetta					
54	M/S. Hotel, Alsalah, Fatimah Jinnah Road Quetta	-	=	--	Rs.-	2
55	M/S. Hote Sheraz, Fatima Jinnah Road Quetta	-	=	3--do--	Rs.-	1
56	M/S. New Pak Hotel, Masjid Road Quetta	-	=	7--do--	Rs.-	2
57	M/S. Kaghan Hotel, Masjid Road Quetta	-	=	12--do--	Rs.-	2
58	M/S. Star Plus Hotel, Dr Bano Road Quetta	-	=	2--do--	Rs.3.00 lac	2
59	M/S. Mohmood Tonsavi Hotel, Sirki Bus Adda Quetta	-	=	6--do--	Rs.5.00 lac	3
60	M/S. Haji Asad Khan Musafar Khana, Sirki Adda,Qta	-	=	-	Rs.60000	3
61	M/S. Wass Musakhail Musafar Khana,New Bus Adda, Quetta	-	=	-	Rs.8000	3
62	M/S. Green Ziarat, Hotel, New Buss Adda Quetta	-	=	-	Rs.-	3
63	M/S. Khojac Hotel, New Buss Adda Quetta	-	=	-	Rs.-	2
64	M/S. Balochistan shoes	-	Shoes	-	Rs.-25000	2

	Makers, Sariab Road Quetta					
65	M/S. Kabir Chappal Makers, New Zarghoon Road Quetta	-	Shoes	-	Rs.25000	3
66	M/S. Bolan Shoes Makers, Burma Hotel, Sariab road Quetta	-	Shoes	-	20000	2
67	M/S. Ayub Footwear, Burma Hotel, Sariab Road Quetta	--	Shoes	-	25000	2
68	M/S. Baloch Shoes Makers, Sariab Road Quetta	-	Shoes	-	15000	3
69	M/S. Balochistan Chappal Makers, Prince Road Quetta	--	Shoes	-	10000	2
70	M/S. Kalat shoes Makers, , Prince Road Quetta	-	Shoes	-	12000	2
71	M/S. Baloch Shoes Makers, , Prince Road Quetta	-	Shoes	-	8000	2
72	M/S almeerak Chappal Makers, Prince Road Quetta	-	Shoes	-	15000	1
73	M/S Sajjad Shoes Makers,	--	Shoes	-	1000	2

	Prince Road Quetta					
74	M/S Master Chappal Shop, Prince Road Quetta	-	Shoes	-	200000	3
75	M/S Marri Chappal Shop, Prince Road Quetta	-	Shoes	-	15000	3
76	M/S Sarwan Chappal Makers, Prince Road Quetta	-	Shoes	-	15000	2
77	M/S Taj Shoes Makers, Prince Road Quetta	-	Shoes	-	13000	2
78	M/S Faiz Chappal Makers, Prince Road Quetta	--	Shoes	-	15000	2
79	M/S Shah Chappal Makers, Prince Road Quetta	-	Shoes	-	12000	2
80	M/S Mastung Chappal Makers, Prince Road Quetta	-	Shoes	-	10000	2
81	M/S Rakhshani Chappal Shop, Prince Road Quetta	-	Shoes	-	8000	2
82	M/S Meerbal Chappal Makers, Prince Road Quetta	-	Shoes	-	11000	2
83	M/S Asmat Rootwear, Arbab Ghulam Ali Road Dibba, Qta	-	Shoes	-	10000	2

84	M/S Rehmat Footwear Arbab Ghulam Ali Road Dibba, Qta	-	Shoes	-	20000	2
85	M/S Super Star Footwear, Arbab Ghulam Ali Road Dibba, Qta	-	Shoes	-	15000	2
86	M/S Famous Fotwear, Arbab Ghulam Ali Road Dibba, Qta	-	Shoes	-	25000	2
87	M/S Najeeb Footwear, Arbab Ghulam Ali Road Dibba, Qta	-	Shoes	-	4000	1
88	M/S Shajeen Footwear, Arbab Ghulam Ali Road Dibba, Qta	-	Shoes	-	2000	2
89	M/S Sulman Footwear, Arbab Ghulam Ali Road Dibba, Qta	-	Shoes	-	2000	2
90	M/S Suraj Iron Sadiq Shaheed Road Quetta	663415	Steel Iron Works	-	35000	3
91	M/S Agha Iron Sadiq Shaheed Road Quetta	-	--do--	-	65000	5
92	M/S Pakistan Iron Sadiq Shaheed Road Quetta	-	--do--	-	-	3
93	M/S Bolan Steel Mill, Kirrani Road Quetta	-	--do--	-	-	2

94	M/S Bilal Iron, Sadiq Shaheed Road Quetta	-	--do--	-	30000	-
95	M/S Moon Iron sadiq Shaheed Road Quetta	-	--do--	-	30000	2
96	M/S United Engineering Works, Sadiq Shaheed Road Quetta	-	--do--	-	-	2
97	M/S Awan Iron Works, Sadiq Shaheed Road Quetta	-	--do--	-	30000	2
98	M/S Akhtar Eng: Mir Ahmed Khan Road Quetta	-	--do--	-	10000	2
100	M/S Royal Engg: QITE Quetta	-	--do--	-	1.5 million	2
101	M/S Dar Steel Mill, Phase IV QITE Quetta	-	--do--	-	.12 million	4
102	M/S Bolan Re-Rolling PhaseIV QITE Quetta	-	--do--	-	-	4
103	M/S Qazi Steel Qorks, P.No. B-71 QITE Quetta	-	--do--	-	-	15
104	M/S Agha Furniture Mart, Qta Sirki Road	-	Furniture	-	10000/-	1
105	M/S Ch: Wood Work, Sirki Rod Quetta	-	--do--	-	10000/-	4
106	M/S Royal Furniture	-	--do--	-	-	4

	Quetta					
107	M/S Arabian Sweets Shahwak Shah Road	824699	Sweet	-	90000/	3
108	M/S Jivay Lal Sweet Shahwak Shah Road	830346	--do--	-	60000/-	4
109	M/S Patel Ice Factory, Patel Road Quetta	84038	Ice Block	20 Block/day	50000/-	4
110	M/S Karwan Ice Factory, Western by Pass Samungli Road Quetta	-	--do--	150--do--	2000000/-	4
111	M/S Crystal Ice Factory, Zarghoon Road Quetta	-	--do--	20 ton /day	.7 million	5
112	M/S Chashma Poltry Farm,Chashma Achozai, Quetta	880345	Poltry	-	1000000/-	5
113	M/S Government Poltry Farm Browery Road Quetta	853642	--do--	-	9436634/-	34

List of Brick Killn Owners in Quetta

1. Haji Abdul Khaliq Bareech,
2. Haji Nabi,
3. Dad Muhammad Shahwani,
4. Haji Khuda Bakhsh,
5. Muhammad Azam Shawani,
6. Haji Moula Bakhsh Shawani,
7. Abdul Rasool Shahwani,
8. Haji Khuda Bakhsh,
9. Jaffar Kurd,
10. Kamal and Jameel Mizari,
Owners of Four Bhattas,
11. Ali Shahwani,
12. Ghulam Muhammad Nasir ,
Owner of three Bhattas,
13. Azad khan owner of three Bhattas,
14. Haji Bashir Ahmed owner of Bhattas,
15. Muhammad Khan Achakzai,
16. Amin and others owner of two Bhattas,
17. Aminullah and others owners of three Bhattas,
18. Muhammad Ali Hazara owner of Four Bhattas,
19. Malik Abdul Ghaffar owner of two Bhattas
20. Malik Abdul Samad owner of one Bhatta,
21. Malik Abdul Samad owner of one Bhatta

22. Noor Muhammad owner of two Bhatta,
23. Mitha Khan,
24. Shah Shahjehan,
25. Nazir Ahmed owner of two Bhattas,
26. Muhammad Ibrahi
27. m owner of three Bhattas,
28. Moula Jan,
29. Doulat Khan,
30. Gulistan,
31. Bahadur Khan,
32. Naimatullah,

NUMBER OF MOTOR VEHICLES STOOD REGISTERED

Division/ District	Total	Private Vehicles					Public Service Vehicles				Govt./Good Vehicle			
		M/Cycle. Sector.	Car	Jeep	S.Wa- gon	Tractor	Bus	Taxi	Reck- Shaws	D- Van	Open Truck	Tankers		
												Oil	Gas	Water
Balochistan	15746 0	44238	15429	9950	7122	11912	7166	583	2963	3011	1247	160	22	98
Quetta Div	<u>10501</u> <u>3</u>	<u>34802</u>	<u>12059</u>	<u>5759</u>	<u>4631</u>	<u>7688</u>	<u>4352</u>	<u>577</u>	<u>2962</u>	<u>2617</u>	<u>1167</u>	<u>137</u>	<u>21</u>	<u>92</u>
Quetta	98429	33918	11585	5413	4237	4930	4176	576	2949	2587	1087	130	21	82
Pishin	4110	263	279	174	232	2532	71	1	13	21	35	4	0	0
Chagi	2463	620	191	170	160	226	105	0	0	9	45	3	0	10
Killa Abdullah	11	1	4	2	2	0	0	0	0	0	0	0	0	0
Zhob Div	<u>12904</u>	<u>3887</u>	<u>1077</u>	<u>279</u>	<u>257</u>	<u>1541</u>	<u>589</u>	<u>0</u>	<u>1</u>	<u>100</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Zhob	2870	222	99	98	76	412	296	0	0	100	0	0	0	0
Loralai	10034	3665	978	181	181	1129	293	0	1	0	0	0	0	0
Killa Saifullah	0	*	**	**	**	**	**	**	**	**	**	**	**	**
Musa Khail	0	*	*	*	*	*	*	*	*	*	*	*	*	*
Barkhan	0	*	*	*	*	*	*	*	*	*	*	*	*	*
Sibi Div	<u>5838</u>	<u>1951</u>	<u>573</u>	<u>-779</u>	<u>107</u>	<u>382</u>	<u>393</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>32</u>	<u>5</u>	<u>0</u>	<u>4</u>
Sibbi**	4767	1542	404	543	95	315	361	0	0	0	32	5	0	4
Ziarat	205	48	44	42	4	28	2	0	0	0	0	0	0	0
Kohlu	866	361	125	194	8	39	30	0	0	0	0	0	0	0
Dera Bugti	0	***	***	***	***	***	***	***	***	***	***	***	***	***
Nasirabad Div	4482	1227	306	87	51	1474	03		0	0	36			

Jaffarabad	3331	797	204	45	33	1284	63		0	0	0			
Nasirabad	310	48	13	4	10	117	0		0	0	0			
Jhalmagsi	56	15	10	2	1	3			0	0	0			
Bolan	785	367	79	06	7	70	1		0	0	36			
<u>Kalat Div</u>	<u>2725</u>	<u>2163</u>	<u>1392</u>	<u>611</u>	<u>1908</u>	<u>665</u>	<u>508</u>		<u>0</u>	<u>290</u>	<u>3</u>			
Kalat	1690	647	212	25	57	143	03		0	5	0			
Mastung	26	2	6		1	11			0	0	0			
Khuzdar	1137	275	83	05	52	163	09		0	0	1			
Kharan	368	124	51	4	18	42			0	0	2			
Awaran	8	0	1		1	0			0	0	0			
LAsbela	24046	1115	1039	253	1779	306	09		0	285	0			
<u>Mekran Div</u>	<u>1611</u>	<u>208</u>	<u>22</u>	<u>35</u>	<u>168</u>	<u>162</u>	<u>1</u>		<u>0</u>	<u>4</u>	<u>9</u>	<u>3</u>		
Turbat	1294	154	16	5	135	142	3		0	4	7	3		
Gawader	189	43	1	2	23	7			0	0	0			
Panjgur	128	11	5	8	10	13			0	0	2			

INDUSTRIAL DIRECTORY BALOCHISTAN LASBELA DISTRICT

S. No	Name and Address of the Unit	Description of Products manufactured.	Phone. No.	Year of Establishment	Investment	Unit of Measurement	Actual Installed Capacity	Man Power	Remarks
Chemical Industry									
1	Allied Chemical Ind. Ltd. 108 Moza Baroot, Hub	Soap and Glycerine.	2434177-78	1985	6.859	Kg	1500 Kg	20	
2	Dyno Pakistan Ltd. 101 to 105 & 136, HITE Hub.	Formaldehyde Urea Formaldehyde Molamine Formuldehyde	32438 32586 32587 430109-110 430151-152	1982	16.500	M.T	9000	185	
3	Rapid Ltd. A-104-132, 133 HITE Hub	Formaldehyde and Urea	439671 32591	1988	1.036	Kg	5067900	45	
4	Pak. Strcone Industries Pvt. Ltd. Hub	Polystyrene Moulding compound	213646 2624146	1989	-	-	1382750	40	
5	International	Soap Plant	414139	28.6.1988	-	Tons	2100	30	

	Consumer Products. Pvt. Ltd. Hub		410516						
6	Otsuka Pakistan Ltd. F-4-9, HITE Hub	I.V Solution	323 63	Sep:1 989	10 5.482		3 761137	-	
7	AG, Pesticides (Pvt) Ltd. Hub	Agtexine Alminium Pheshide.	778 1626	26.3. 1986	11. 153	.Ton	2 00	26	
8	Chenn Dyestuff Industries Ltd. B/171-174, HITE Hub	Dyes Manufacturing	241 0830	13.12 .1989	41 804	g	9 0925	60	
9	Pakistan Waxes (Pvt).Ltd. HITE Hub	Sweeters Chillers Boilers	470 211	14.8. 1985	-	. Tons	2 400 8 0 3	40 3	
10	Bela Chemical Industries, LTd. Sommiani, Vinder.	Caustic Soda Hydrochlosio Acid Liquid Chlorine Gas Sodium Hypochloride	439 228	16.7. 1988	92 5.812		7 200 5 768 6 72 1 620	330	
11	Gam	Flocked	224	1984	19.		8		

	Internation Ltd. 525-526, Mohammadi House, 1.1 Chundrigar Road Karachi.	Printed Thick Material Flocked Paper Flocked Made up Goods Flocked Printed Walls.	629 223	229		00	e. M.	64000 1 728000 1 44000 T Shirts. 1 728000 1 0800		
12	Prochem Industries Ltd. 50-A, Khyaban-e- Shaheen Defence, Society, Khi	Protective Coatings	793	532	1982	1.9	ons	100	2	
13	Rehmat Dye Stuff Ltd. Hub	Reactive Directverbs Direct and Agric: Acidcolour for textile and Herbal extracts.	1567 4821	242 242	1983	78	21.	20	1	12
14	Taibah Chemmerals, Hub	I.V. Glucose solu: T.V. Sets various.	214	270 320	1981	50	9.2	illion .0 .02	1 4	

15	Gem Industries, Hub	Due and Artificial Carpets							
16	Kail Goan Industry, Hub	Chemical for Insulation.							
17	Fauji Polypropylene Products, 1 st floor Dadbhoy Centre, Shahr-e-Faisal, Karachi	PP Woven Bags	12 322 33 323	1981	62. 51.	illion	6.5 1	325	

Annex-P

List of Target Industries

Hub Industrial Trading Estate, HUB

.No	Title of Firm	Type of Industry	Location	Remarks
	M/S DYNE Pakistan LTD	CHEMICAL INDUSTRY	A-101 TO A-103 & A-134 TO A- 136	PC D, DIOXIN
	M/S PHONIX CHEMICALS PVT LTD	CHEMICAL INDUSTRY	A-226 TO A-231	PC B, DIOXIN
	M/S HINEX INDUSTRIES LTD	GLASS WEAR MFG. INDS	A-90	DI OXIN
	M/S HTG PETRO CHEMICAL INDS	CHEMICAL INDUSTRY	B- 1(A)	PC B, DIOXIN
	M/S SHAN CHEMICAL INDS	CHEMICAL INDSUTRY	B-156 & B-157	PC B, DIOXIN
	M/S BAWANI METALS LTD	METAL ENGINEERING INDS	C-162 TO C-175	PC B, DIOXIN
	M/S CERA-E- NOOR	CERAMICS INDUSTRY	C-288 TO C-293 & C-301 TO 306	DI OXIN
	M/S HUB RE- ROLLING MILLS	STEEL RE- ROLLING	C	PC B, DIOXIN
	M/S Pakistan SYNTHETICS LTD	POLYESTER FIBRE	F-1 TO F-3	DI OXIN, PCB
0	M/S FRIENDSHIP	POWER GENERATION PLANT	K-3	PC B,

	ENERGIES PVT, LTD			DIOXIN
1	M/S ALLIED PLASTIC INDS LTD	PLASTIC SHEET INDS	N-1	PC B, DIOXIN
2	Siddiq Sons			
3	Pakistan Sythetic			
4	Getro Power 23m/watt Gatron Industries Ltd.	Power		
5	Diamond International	Power		
6	NP Cotton			
Winder Industrial Trading Estate				
7	M/S BALCHEM PVT. LTD (Closed)	CHEMICAL INDSUTRY	A-74	PC B, DIOXIN
8	M/S METAPREP PVT. LTD	CHEMICAL UNIT	A-78	PC B, DIOXIN
9	New Allied Electronic Industries (Pvt) Ltd.	Small Power Generation Plant		
Uthal Industrail Estate				
0	M/S MANDVIWALLA MAUSER PLASTIC INDUSTRIES LTD	PLASTIC INDUSTRY	C-1	PC B, DIOXIN
Hub Industrial Trading Estate				
1	M/S HUB POWER COMPANY LTD	POWER GENERATION PLANT	Mouza kund, hub	PC B, DIOXIN
2	M/S ATTOCK CEMENT Pakistan	CEMENT INDUSTRY	Nouza sakran, hub	DI OXIN

	LTD			
3	M/S BOLAN CASTING INDUSTRIES	CASTING INDUSTRY	Mauza Baroot, hub	PC B, DIOXIN
4	BOSICOR Oil Refinery	Miscellaneous	Mauza Kund, Hub	PC B, DIOXIN

Type of Plant	Cement	[*]
	Lime	[]
	Brick	[]
	Glass	[]
	Ceramics	[]
	Asphalt mixing	[]
Address	MS Attock Cement Pakistan Ltd. Nouza Sakran Hub.	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Muhammad Abbas Senior Assistant Manager Ph: 021-5611764	
Number of Furnaces	1 Kiln	
Feed Materials (type, quantity = t/a)		
Primary Fuel (type, quantity = t/a)		
Secondary/Alternative Fuel (type, quantity = t/a)		
Type of Process	Dry [*]	Wet []
Type of Operation	Batch (e.g., 100 kg per batch)	[]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[*]
Annual Operational/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	856000 t/a

Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	856000 t/a
Type of Furnace	Rotary kiln Shaft kiln Tunnel furnace Other (please specify)	
Temperature Furnace	in Main furnace (°C) Second chamber/afterburner (°C)	

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)	[]	
None	[]	
Heat Recovery System	Yes []	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation [] Landfill []
Generation of Fly Ashes	t/a []	Recirculation [] Landfill []
Generation of (Waste)Water	t/a []	Disposal []
Generation of Sludges (as dry matter)	t/a []	Recirculation [] Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues

3	0.05				0.003
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues
856000	0.0428				0.00257

Region/Province/Nation.	Balochistan		
Address			
Contact (Name, position, phone and fax numbers, e-mail)	Source : Development Statistics of Balochistan 2001-2002, Bureau of Statistics P &D Department		
Type of fuel	Leaded Gasoline	Unleaded Gasoline	Diesel/Light Fuel Oil
Annual national fuel consumption in liter per year (L/a)			
Passenger Cars			
Number of vehicles	10500	18700	29314
Annual road performance per vehicle and kilometer (km/a)			
Fuel consumption (L/km; L/a)			
Total annual consumption (L/a)			
APCS* (Yes/No)			
Busses			
Number of busses			7166
Annual road performance per vehicle and year (km/a)			
Fuel consumption (L/km; L/a)			
Total annual consumption (L/a)			
Annual consumption in tons per year (t/a)			
APCS (Yes/No)			
Tractors and Trucks			
Number of busses			49533

Annual road performance per vehicle and year (km/a)			
Fuel consumption (L/km; L/a)			
Total annual consumption (L/a)			
Annual consumption in tons per year (t/a)			
APCS (Yes/No)			
Ships			
Number of ships			
Annual performance per vehicle and year (km/a)			
Fuel consumption (L/km; L/a)			
Total annual consumption (L/a)			
Annual consumption in tons per year (t/a)			
APCS (Yes/No)			
Trains			
Number of trains (on any of the above fuels)			
Annual railroad performance per vehicle and year (km/a)			
Fuel consumption (L/km; L/a)			
Total annual consumption (L/a)			
Annual consumption in tons per year (t/a)			
APCS (Yes/No)			

Final classification and evaluation **(to be filled out by the data evaluator)**

	Emission Factor ($\mu\text{g TEQ/t}$)
--	---

Class	Air	Water	Land	Product	Residues
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues
	0.115				

***APCS: means catalyst for gasoline and particulate removal for Diesel**

Plant Type of Steel Re-rolling	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary [*]	Secondary
	Foundry	Primary []	Secondary
	Copper	Primary []	Secondary
	Aluminum	Primary []	Secondary
	Lead	Primary []	Secondary
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary
Shredder	[]		
Other	Primary []	Secondary	
Address	Bolan Steel Mills KIRRANI Road Quetta		
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Muhammad Safdar		
Number of Furnaces	One		
Type of Operation	Batch (e.g., 100 kg per batch)	[]	
	Semi-continuous (e.g., 12 hours per day)	[*]	
	Continuous (24 hours per day)	[]	
Annual Operational/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day)		30 t/d

	d/a (days per year) h/a (hours per year) t/a (tons per year)	
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	10950 t/a
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	Electric arc furnace
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	1600
Primary Fuel	Type Electric fired	t/a
Secondary/Alternative Fuel	Type --	t/a or %
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bagfilter Wet scrubber Dry scrubber Lime injection NaOH/alkali injection Active carbon/coke injection Active carbon filter Catalytic converter (SCR) Induced or forced draft fan	[] [] [] [] [] [] [] [] [] [] []

	Other (please specify) None	[*]
Heat Recovery System	Yes []	No [*]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues		
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a [500]	Recirculation []	Landfill [*]

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
1	10	-	-	-	15
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues
10950	0.11				0.1648

Questionnaire 7: Category 7 – Production and Use of Chemicals and Consumer Goods (releases into air and into water) Annex-H1

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated Organochlorine production	[]
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
Petroleum industry refineries	[*]	
Address		
Contact (Name, position, phone and fax numbers, e-mail)		
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Crude Oil	750000
Capacity: Final Product of Raw Materials (type, quantity = t/a)		
Type of Process	Fixed-bed	[]
	Fluidized bed	[]
	Other	[*]
Type of Operation	Batch (e.g., 100 kg per batch)	[]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[*]
Annual Operation/Capacity (per	t/h (tons per hour) h/d (hours per day)	

Unit)	d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	7,25,000
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	7,25,000
Operation/ Production Temperature	(°C)	330-345
Water discharge (L/h, m³/a)		200/H
Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[*] [] [] [] []
Sludge generation	t/a (tons per year)	N/A
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	N/A
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter Wet scrubber Dry scrubber Lime injection	[] [] [] [] [] N / A []

	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	[]
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	N/ A

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

	Emission Factor (µg TEQ/t)				
Class	Air	Water	Land	Product	Residues
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues

Type of Plant Hospital Waste Incinerator	Municipal solid waste	[]
	Industrial waste	[]
	Hospital waste	[]
	Light shredder	[]
	Sewage sludge	[]
	Waste wood and waste biomass	[]
	Animal carcasses	[]
Name of Plant	CHQ (Children Hospital Quetta). Hospital Waste Incinerator	
Location (City/Province)	Quarary Road, Quetta	
Address		
Contact (Name, position, phone and fax numbers, e-mail)	Azizullah Bio Medical Engineer Ph: 823705-11(246), Fax: 823712	
Number of Furnaces		
Type of Operation	Batch (<i>e.g.</i> , 100 kg per batch)	[*]
	Semi-continuous (<i>e.g.</i> , 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	14 Kg/day 5.11 ton/year
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day)	

	d/a (days per year) h/a (hours per year) t/a (tons per year)	5.1 T/a
Type of Furnace	Mass burn waterwall (grate) Fluidized bed Stoker Rotary kiln Other (please specify)	
Temperature in Furnace	Main furnace (°C) Afterburner/second chamber (°C)	650

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bag filter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)		
None		[*]
Heat Recovery System	Yes []	No [*]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m³/h) (dry gas)	

Residues	Disposal of these Residues	
Generation of Bottom Ashes	t/a [] 1 kg []	Recirculation [] Landfill [*]
Generation of Fly Ashes	t/a []	Recirculation Landfill

]	[]	[]
Generation of (Waste)Water	t/a	[Disposal
Generation of Sludges (as dry matter)	t/a	[Recirculation
]	[]	Landfill

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor ($\mu\text{g TEQ/t}$)				
	Air	Water	Land	Product	Residues
1	40,000				200
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues
5.11 t/a	0.20				0.001

Questionnaire 7: Category 7 – Production and Use of Chemicals and Consumer Goods (releases into air and into water) Annex-H2

Chemical Industry: Type of Plant	Pulp and paper industry: Pulp	[]
	Pulp and paper industry: Paper (primary or recycling)	[]
	Pulp and paper - integrated	[]
	Organochlorine production	
	Ethylene dichloride	[]
	PVC	[]
	Pesticides (PCP, 2,4,5-T, 2,4-D)	[]
	Production of chlorine gas (graphite electrodes)	[]
Petroleum industry refineries	[]	
Address	m/s dyne Pakistan Ltd. A-101 to A-103 & A-134 to A-136	
Contact (Name, position, phone and fax numbers, e-mail)	Syed Anwar-ul-Haq Haqqi Fax: 32587 Dy. Gen. Manager (Works) Ph: 32447 dyneahub@dynea.com.pk,	
Capacity: Consumption of Raw Materials (type, quantity = t/a)	Melamine, Urea, Methanol, Cellulose	
Capacity: Final Product of Raw Materials (type, quantity = t/a)	Moulding Compound F.A Resin	
Type of Process	Fixed-bed	[]
	Fluidized bed	[]
	Other	[]
Type of Operation	Batch (e.g., 100 kg per batch)	[]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual	t/h (tons per hour)	MCP 4000 ton/year

Operation/Capacity (per Unit)	h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	F.A 39000 ton/year Resin 34000 ton/year
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Operation/ Production Temperature	(°C)	90-660 c
Water discharge (L/h, m ³ /a)		181000 m/a
Water treatment	Settling pond Aerated lagoon Secondary treatment Tertiary Treatment Others (please specify)	[] [] [] [] []
Sludge generation	t/a (tons per year)	12 t/year
Sludge disposal	Landfill (t/a) Land farming (t/a) On-site (t/a) Incineration (t/a) Others (please specify) (t/a)	Land fit
Type of Air Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bag filter	[] [] []

	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Induced or forced draft fan	[]
	Other (please specify)	Distcollector
	None	[]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a [] 18 t/a]	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues

Plant Type of Power Generation	Power plants	
	Coal	[]
	Lignite	[]
	Bituminous coal	[]
	Anthracite	[]
	Other	
	Natural gas	[*]
	Wood	[]
	Landfill gas	[]
	Sewer gas	[]
	Biomass (please specify)	
	Industrial Combustion units (small)	
	Coal (please specify)	[]
	Lignite	[]
	Bituminous coal	
	Anthracite	[]
Other	[]	
Natural wood	[]	
Combustion of other kinds of biomass		
Sugar cane	[]	
Tapioka	[]	
Cotton	[]	
Bamboo	[]	
Banana	[]	
Harvest residues	[]	
Other (please specify)	[]	
Other (please specify) HSD => optional		
Address	3 rd Floor GD Archade Fazle Haq Road Blue Area Islamabad	
Contact (Name, position, phone and fax numbers, e-mail)	Syed Rizwan Ali Shah, Vice President, Murtaza Khurami hpcmk@ultra.net.pk Killi Almas Shaikh Manda Quetta. Ph:881004. Fax: 881005	

Type of Operation	Batch (e.g., 100 kg per batch) Semi-continuous (e.g., 8 hours per day) Continuous (24 hours per day)	[] [] [*]
Annual Operation/Capacity (per Unit)	t/h (tons per hour) or TJ/h (Terajoule per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) or TJ/h (Terajoule per day) d/a (days per year) h/a (hours per year) t/a (tons per year) or TJ/h (Terajoule per year)	140 MW/h
Annual Operation/Capacity (total)	d/a (days per year) h/a (hours per year) TJ/a (Terajoule per year)	140x24=3360MW/h 3360x365=1226400MWH/a 4415 TJ/a
Type of Furnace/Combustor	Boiler Stack -3 Process heater Flare Turbine (internal gas) Combustion engine (internal) Other (please specify)	

Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	
Type of Abatement Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bughouse filter Wet scrubber Dry scrubber Lime injection	[] [] [] [] [] []

	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Other (please specify)	
	None	[]
Heat Recovery System	Yes [*]	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
4	0.5 µg TEQ/TJ	x	x	x	x
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues
4415 Tj/a	0.002208	x	x	x	x

Type of Plant Power Generation	Power plants	
	Coal	[]
	Lignite	[]
	Bituminous coal	[]
	Anthracite	[]
	Other	
	Natural gas	[]
	Wood	[]
	Landfill gas	[]
	Sewer gas	[]
	Biomass (please specify)	
	Industrial Combustion units (small)	
	Coal (please specify)	[]
	Lignite	[]
	Bituminous coal	
	Anthracite	[]
	Other	[]
Natural wood	[]	
Combustion of other kinds of biomass		
Sugar cane	[]	
Tapioka	[]	
Cotton	[]	
Bamboo	[]	
Banana	[]	
Harvest residues	[]	
Other (please specify)	[]	
Other (please specify) Residual Fuel oil		
Address	Hub Power Company Ltd. Islamic Chamber Building Block 9 – Clifton Karachi	
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Abdul Vakeel Manager Operation Ph: 021-5874677-86, Fax: 021-5870397	

Type of Operation	Batch (e.g., 100 kg per batch) 4 Units. Semi-continuous (e.g., 8 hours per day) 300MW/Unit Continuous (24 hours per day)	[] [] [*]
Annual Operation/Capacity (per Unit)	t/h (tons per hour) or TJ/h (Terajoule per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) or TJ/h (Terajoule per day) d/a (days per year) h/a (hours per year) t/a (tons per year) or TJ/h (Terajoule per year)	
Annual Operation/Capacity (total)	d/a (days per year) h/a (hours per year) TJ/a (Terajoule per year)	1200 MW/h 10512 gigawatt/y 37843.2 TJ/a
Type of Furnace/Combustor	Boiler Process heater Flare Turbine (internal gas) Combustion engine (internal) Other (please specify)	Boiler

Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	1600C° 1300C°
Type of Abatement Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bughouse filter Wet scrubber	[] [] [] []

	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Other (please specify)	[]
	None	[]
Heat Recovery System	Yes [*] Boiler Economizer	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a [36500]	Disposal	50% recycle
Generation of Sludges (as dry matter)	t/a [200 Ton]	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
3	2.5 µg TEQ/TJ				
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues
37843.2 Terajoule/a	0.095				

1 Tera Joule = 277.7778 mega watt
1200 megawatt / h
28800 mega

watt / day = 103.68 Tera joule / day
10512000 mega watt / year = 37843.2

Questionnaire 6: Uncontrolled Combustion Processes

Annex-G

Region/Province/Nation	Quetta		
Address			
Contact (Name, position, phone and fax numbers, e-mail)	Mr. Qadir Lehri Coordinator UBS Cell City District Government Ph: 9201854		
Biomass burning			
Type of biomass, <i>e.g.</i> , pine, sugarcane, <i>etc.</i>	Amount of biomass per hectare burned (t/ha)	Area burned per hectare and year (ha/a)	Amount of biomass burned in tons per year (t/a)
1.			
2.			
3.			
4.			
5.			
Total			
Open Waste Burning and Accidental Fires			
General waste statistics			
Tons of waste generated	Per capita and day	Per capita and year	Nationally per year (t)
140 t/d			
Type of source	Amount of waste burned per capita (t/a)	Number of inhabitants	Amount of waste burned per year (t/a)

	(%)	(t/a)	(%)	(t/a)	(%)	(t/a)
1. Landfill fires						
2. Uncontrolled domestic waste burning						
3. Open burning of wood (construction/ demolition)						
Region/Province/Nation-wide						
	Number of houses burned per year (No/a)			Number of vehicles burned per year (No/a)		
4. Accidental fires in houses, factories						
5. Accidental fires in vehicles						

Final classification and evaluation **(to be filled out by the data evaluator)**

Class	Emission Factor ($\mu\text{g TEQ/t}$)				
	Air	Water	Land	Product	Residues
1	1000				
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues
51100	51.1				

Questionnaire 2: Category 2 – Ferrous and Non-Ferrous Metal Production Annex-C2

Type of Plant Copper mining and Production	Sinter	[]	
	Coke	[]	
	Iron and/or steel	Primary []	Secondary []
	Foundry	Primary []	Secondary []
	Copper	Primary [*]	Secondary []
	Aluminum	Primary []	Secondary []
	Lead	Primary []	Secondary []
	Zinc	[]	
	Brass/Bronze	Primary []	Secondary []
	Magnesium	[]	
	Other non-ferrous metal	Primary []	Secondary []
Shredder	[]		
Other	Primary []	Secondary []	
Address		Saindak Metal, Ltd. 73 A, 2 nd Street Jinnah Town Quetta	
Contact (Name, position, phone and fax numbers, e-mail)		Tufail M. Babar Company Secretary, Ph: 9201475, Fax: 828336 smlho@qta.paknet.com.pk	
Number of Furnaces		(20000 ton)	
Type of Operation		Batch (e.g., 100 kg per batch)	[]
		Semi-continuous (e.g., 8 hours per day)	[]
		Continuous (24 hours per day)	[*]
Annual Operational/Capacity (per Unit)		t/h (tons per hour) h/d (hours per day) d/w (days per week)	17500 t/a Cu 1.33 t/a Gold

	t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	2.50 t/a Silver
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	
Type of Furnace	Blast furnace Induction furnace Electric arc furnace (EAF) Cowper Rotary kiln Reverberatory Other (please specify)	
Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	1400
Primary Fuel	Type 150 t/d Furnace oil	t/a
Secondary/Alternative Fuel	Type	t/a or %

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)	[]	
None	[*]	
Heat Recovery System	Yes []	No [*]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues		
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a [4575]	Disposal	
Generation of Sludges (as dry matter)	t/a [1642]	Recirculation []	Landfill [*]

Tailing Dam size 1.5 sqkm

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues

4	0.03	-	-	-	
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues
17500	0.000525				

Questionnaire 4: Category 4 – Mineral Production

Annex-E2

Type of Plant	Cement	[]
	Lime	[]
	Brick	[*]
	Glass	[]
	Ceramics	[]
	Asphalt mixing	[]
Address	Spenzat 13 mile from Quetta	
Contact (Name, position, phone and fax numbers, e-mail)	Haji Ghulam Mohammad Nasar Ph: 03337804797 Haji Ghulam Akbar	
Number of Furnaces	One chimney	
Feed Materials (type, quantity = t/a)	Clay	
Primary Fuel (type, quantity = t/a)	Coal 165 tan + Wood	
Secondary/Alternative Fuel (type, quantity = t/a)	Coal	
Type of Process	Dry []	Wet []
Type of Operation	Batch (e.g., 100 kg per batch)	[]
	Semi-continuous (e.g., 8 hours per day)	[]
	Continuous (24 hours per day)	[]
Annual Operational/Capacity (per Unit)	t/h (tons per hour)	40000 bricks/day
	h/d (hours per day)	7300000 Bricks /year
	d/w (days per week) 6 month	18250 ton / year
	t/d (tons per day)	Or

	d/a (days per year) h/a (hours per year) t/a (tons per year)	100 ton /day
Annual Operation/Capacity (total)	t/h (tons per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) d/a (days per year) h/a (hours per year) t/a (tons per year)	18250 ton / year
Type of Furnace	Rotary kiln Shaft kiln Tunnel furnace Other (please specify)	
Temperature Furnace	in Main furnace (°C) Second chamber/afterburner (°C)	

Type of Air Pollution Control System (APCS)	Electrostatic precipitator	[]
	Cyclone	[]
	Bagfilter	[]
	Wet scrubber	[]
	Dry scrubber	[]
	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
Induced or forced draft fan	[]	
Other (please specify)	[]	
None	[]	
Heat Recovery System	Yes []	No [*]
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues	Disposal of these Residues		
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Emission Factor (µg TEQ/t) 0.2					
Class	Air	Water	Land	Product	Residues

1	0.2	x	x	x	x
	Annual Release (g TEQ/a)				
Annual Activity (t/a)	Air	Water	Land	Product	Residues
18250	0.00365				

Brick Kiln

1- 0.8 million Bricks/Cycle

2- 7 Cycle / Year

3- Total Bricks / Year = 6.6 million

4- Unit Brick = 2 kg

5- Total weight of Bricks into ton

$$\begin{aligned} & 5.6 \times 2 = 11.2 \text{ million kg} \\ & = 11.2 / 1000 = 11200 \text{ ton/year} \end{aligned}$$

1 Ton of Brick produces = 0.2 μg TEQ

11200 ton ===== = 0.2 x 11200
= 2240 μg TEQ

NOTE: EMISSION FACTOR = 0.2 μg TEQ / t

Type of Plant Power Generation	Power plants	
	Coal	[]
	Lignite	[]
	Bituminous coal	[]
	Anthracite	[]
	Other	
	Natural gas (Low BTU)	[*]
	Wood	[]
	Landfill gas	[]
	Sewer gas	[]
	Biomass (please specify)	
	Industrial Combustion units (small)	
	Coal (please specify)	[]
	Lignite	[]
	Bituminous coal	
	Anthracite	[]
	Other	[]
Natural wood	[]	
Combustion of other kinds of biomass		
Sugar cane	[]	
Tapioka	[]	
Cotton	[]	
Bamboo	[]	
Banana	[]	
Harvest residues	[]	
Other (please specify)	[]	
Other (please specify) HSD for Backup & Start up		
Address	No. 107, 1 st Floor, Evacuee Trust Complex, Sir Agha Khan Road F-5/1 Islamabad. Plant Contact, UPP, Dera Murad Jamali. Distt. Nasir Abad Balochistan.	
Contact	Hassan Shehryar Malik,	

(Name, position, phone and fax numbers, e-mail)	Senior Manager (e-mail: shehryar@uchpower.com) Ph: 051-2828001-2, 051-2828010, Fax: 0740 612954	
Type of Operation	Batch (e.g., 100 kg per batch) Semi-continuous (e.g., 8 hours per day) Continuous (24 hours per day)	[] [] [*]
Annual Operation/Capacity (per Unit)	t/h (tons per hour) or TJ/h (Terajoule per hour) h/d (hours per day) d/w (days per week) t/d (tons per day) or TJ/h (Terajoule per day) d/a (days per year) h/a (hours per year) t/a (tons per year) or TJ/h (Terajoule per year)	586 mw/day
Annual Operation/Capacity (total)	d/a (days per year) h/a (hours per year) TJ/a (Terajoule per year)18480.1 J/a	5133360 MW/a 18480.1 TJ/a
Type of Furnace/Combustor	Boiler Process heater Flare Turbine (internal gas) Combustion engine (internal) Other (please specify)	

Temperature in Furnace	Main furnace (°C) Second chamber/afterburner (°C)	700°C
Type of Abatement Pollution Control System (APCS)	Electrostatic precipitator Cyclone Bughouse filter Wet scrubber Dry scrubber	[] [] [] [] []

	Lime injection	[]
	NaOH/alkali injection	[]
	Active carbon/coke injection	[]
	Active carbon filter	[]
	Catalytic converter (SCR)	[]
	Other (please specify)	[]
	None	[]
Heat Recovery System	Yes [*] Boiler	No []
Temperature of Gases	At entry to APCS (°C) []	At exit from APCS (°C) []
Flux of Exit Gases	(m ³ /h) (dry gas)	

Residues		Disposal of these Residues	
Generation of Bottom Ashes	t/a []	Recirculation []	Landfill []
Generation of Fly Ashes	t/a []	Recirculation []	Landfill []
Generation of (Waste)Water	t/a []	Disposal	
Generation of Sludges (as dry matter)	t/a []	Recirculation []	Landfill []

Final classification and evaluation (to be filled out by the data evaluator)

Class	Emission Factor (µg TEQ/t)				
	Air	Water	Land	Product	Residues
4	0.5 µg TEQ/TJ	x	x	x	x
Annual Activity (t/a)	Annual Release (g TEQ/a)				
	Air	Water	Land	Product	Residues
18480.1 TJ/a	0.00924	x	x	x	X

Alternate Conversion for Power Generation

- 1. UCH = 5133360MW/a = 18480.1 TJ/a = 18480100 J/a**
- 2. Habibullah = 1226400 = 4415 = 4415000 J/a**
- 3. Hubv Co = 10512000 = 37843.2 = 37843200 J/a**

If converted into Ton as per Energy used for measuring the energy of an explosion (Nuclear explosion)

1 ton = 4.184 G Joules

- 1. = 4416850 Ton**
- 2. = 1055210.3 Ton**
- 3. = 9044741.8 Ton**

**if converted in ton on the basis of unit of Power used in refrigeratino Engineering
one ton of refrigeration to be the power required to freeze one short ton water**

0C in 24 hours = 3.516853 Kilo watts

$$\begin{aligned} &= \quad \mathbf{12000 \text{ BTU / h}} \\ &\quad \mathbf{200 \text{ BTU / m}} \\ &= \quad \mathbf{4.7162 \text{ Horse Power}} \end{aligned}$$