



PPEPCA

Sectoral Guidelines for Upstream Petroleum Sector - Onshore

Volume 1 of 2
Final Report



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Pakistan Petroleum Exploration and Production Companies Association

Sectoral Guidelines for Upstream Petroleum Sector – Onshore

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Introduction

The importance of environmental issues is becoming more and more central to the oil and gas upstream exploration and production industry in Pakistan. Compared with the early periods of exploration and production in the country when little was known about environmental issues, new projects and programmes now are subject to strict environmental scrutiny and compliance. With the enactment of the Pakistan Environmental Protection Act (1997), it is mandatory for all E&P projects to undertake an environmental assessment that is submitted to the concerned environmental protection agency for decision. The requirement has exposed the upstream petroleum industry to a new and growing challenge of understanding the impacts of its operation and their mitigation; identifying and consulting with people and organisations who might be affected or can influence its activities; monitoring and reporting its compliance with environmental obligations and adopting best-practices and strict environmental controls whilst operating in environmentally sensitive areas.

The present guidelines have been prepared to assist the industry and the practitioners in meeting these challenges. The need for the development of these guidelines was felt by the industry few years back when the industry sectoral guidelines prepared by the Federal EPA were found to be insufficient. The present new guidelines are based on previous work by international industry associations, donor agencies, non-government organisations, and statutory bodies and national experiences. The guidelines have been divided into 4 parts for clarity and ease of use with details of the individual parts given below.

Part I: The Upstream Onshore Petroleum Industry

This section of the guidelines provide a history of the industry's operations in Pakistan; key institutions associated with the industry; and generic impacts and their mitigation.

Part II: Guidelines for Environmental Assessments

This section comprises of three chapters dealing separately with environmental assessments, environmental management plans and environmental monitoring and reporting. Comprehensive guidance is provided on the preparation, review, submission and approval of environmental assessments and environmental management plans and monitoring and reporting requirements applicable to the industry. The section also addresses key issues that the industry and its stakeholders have voiced over the past few years regarding the scope, type and quality of environmental assessments and monitoring. The section emphasises the need to look at the entire life cycle of

environmental assessment and stresses the need for post-environmental assessment monitoring and reporting.

National environmental policies and statutes; international conventions; and national and international guidelines relevant to the industry are also appended as an annexure. The implications and applicability of national environmental statutes summarised in the annexure will vary from project to project and will have to be assessed on a case basis in the environmental assessment.

Part III: Guidelines for Protected Areas

This section identifies the protected areas in Pakistan and outlines procedures for working in protected areas. The guidelines encourage the adoption of best practices, ecosystem approach and net positive benefit approach whilst working in protected areas.

Part IV: Guidelines for Public Consultation

This section provides procedures for public consultation and stresses on the need for continuing public consultation during the entire life cycle of the project. The guidelines identify key stakeholders to E&P projects and their roles and responsibilities in any public consultation programme.

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Part I: The Upstream Onshore Petroleum Industry



1 The Upstream Exploration and Production Sector

1.1 The Upstream Exploration and Production Activities¹

1.1.1 Exploration Surveying

In the first stage of the search for hydrocarbon-bearing rock formations, geological maps are reviewed in desk studies to identify major sedimentary basins. Aerial photography may then be used to identify promising landscape formations such as faults or anticlines. More detailed information is assembled using a field geological assessment, followed by one of three main survey methods: magnetic, gravimetric and seismic.

The Magnetic Method depends upon measuring the variations in intensity of the magnetic field, which reflects the magnetic character of the various rocks present, while the Gravimetric Method involves the measurements of small variations in the gravitational field at the surface of the earth.

A seismic survey is the most common assessment method and is often the first field activity undertaken. The Seismic Method is used for identifying geological structures and relies on the differing reflective properties of sound waves to various rock strata, beneath the surface. An energy source transmits a pulse of acoustic energy into the ground, which travels as a wave into the earth. At each point where different geological strata exist, a part of the energy is transmitted down to deeper layers within the earth, while the remainder is reflected back to the surface. Here it is picked up by a series of sensitive receivers called geophones or seismometers on land, or hydrophones submerged in water.

Special cables transmit the electrical signals received to a mobile laboratory, where they are amplified and filtered and then digitised and recorded on magnetic tapes for interpretation.

Seismic surveys may use dynamite, vibroseis, upholes, or a combination of these for data acquisition. Dynamite is a commonly used energy source, but in certain areas technical considerations may favour use of vibroseis (composed of a generator that hydraulically transmits vibrations into the earth). In areas where preservation of vegetation cover is important, the shot hole (dynamite) method is preferable to vibroseis.

¹ Adapted from E&P/UNEP 1997.

1.1.2 Exploration Drilling

Once a promising geological structure has been identified, the only way to confirm the presence of hydrocarbons and the thickness and internal pressure of a reservoir is to drill exploratory boreholes. All wells that are drilled to discover hydrocarbons are called “exploration’ wells”. The location of a drill site depends on the characteristics of the underlying geological formations. It is generally possible to balance environmental protection criteria with logistical needs, and the need for efficient drilling.

For land-based operations a pad is constructed at the chosen site to accommodate drilling equipment and support services. Land-based drilling rigs and support equipment are normally split into modules to make them easier to move. Once on site, the rig and a self-contained support camp are then assembled. Typical drilling rig modules include a derrick, drilling mud handling equipment, power generators, cementing equipment and tanks for fuel and water. The support camp is self-contained and generally provides workforce accommodation, canteen facilities, communications, vehicle maintenance and parking areas, fuel handling and storage areas, and provision for the collection, treatment and disposal of wastes. The camp occupies a small area and is generally located away from the drilling rig.

Once drilling commences, drilling fluid or mud is continuously circulated down the drill pipe and back to the surface equipment. Its purpose is to balance underground hydrostatic pressure, cool the bit and flush out rock cuttings. The risk of an uncontrolled flow from the reservoir to the surface is greatly reduced by using blowout preventers (a series of hydraulically actuated steel rams that can close quickly around the drill string or casing to seal off a well). Steel casing is run into completed sections of the borehole and cemented into place. The casing provides structural support to maintain the integrity of the borehole and isolates underground formations.

Drilling operations are generally conducted around-the clock. The time taken to drill a bore hole depends on the depth of the hydrocarbon bearing formation and the geological conditions, but it is commonly of the order of few months. Where a hydrocarbon formation is found, initial well tests are conducted to establish flow rates and formation pressure. These tests may generate oil, gas and formation water-each of which needs to be disposed of.

After drilling and initial testing, the rig is usually dismantled and moved to the next site. If the exploratory drilling has discovered commercial quantities of hydrocarbons, a wellhead valve assembly may be installed. If the well does not contain commercial quantities of hydrocarbon, the site is decommissioned to a safe and stable condition and restored to its original state or an agreed after use. Open rock formations are sealed with cement plugs to prevent upward migration of well bore fluids. The casing wellhead and

the top joint of the casings are cut below the ground level and capped with a cement plug.

1.1.3 Appraisal

When exploratory drilling is successful, more wells are drilled to determine the size and the extent of the field. Wells drilled to quantify the hydrocarbon reserves found are called “appraisal” wells. The appraisal stage aims to evaluate the size and nature of the reservoir, to determine the number of confirming or appraisal wells required, and whether any further seismic work is necessary. The technical procedures in appraisal drilling are the same as those employed for exploration wells, and the description provided above applies equally to appraisal operations.

1.1.4 Development and Production

Having established the size of the oil field, the subsequent wells drilled are called “development” or “production” wells. A small reservoir may be developed using one or more of the appraisal wells. A larger reservoir will require the drilling of additional production wells. The number of wells required to exploit the hydrocarbon reservoir varies with the size of the reservoir and its geology. The drilling procedure involves similar techniques to those described for exploration; however, with a larger number of wells being drilled, the level of activity obviously increases in proportion. The well sites will be occupied for longer, and support services workforce accommodation, water supply, waste management, and other services-will correspondingly increase. As each well is drilled it has to be prepared for production before the drilling rig departs. The heavy drill pipe is replaced by a lighter weight tubing in the well and occasionally one well may carry two or three strings of tubing, each one producing from different layers of reservoir rock. At this stage a control valve assembly or “Christmas Tree” replaces the blowout preventer.

Most new commercial oil and gas wells are initially free flowing: the underground pressures drive the liquid and gas up the well bore to the surface. The rate of flow depends on a number of factors such as the properties of the reservoir rock, the underground pressures, the viscosity of the oil, and the oil/gas ratio. These factors, however, are not constant during the commercial life of a well, and when the hydrocarbons cannot reach the surface unaided, some form of additional lift is required, such as a pumping mechanism or the injection of gas or water to maintain reservoir pressures.

Once the hydrocarbon reaches the surface, it is routed to the central production facility, which gathers and separates the produced fluids (oil and gas). The size and type of the installation will depend on the nature of the reservoir, the volume and nature of produced fluids, and the export option selected.

The production facility processes the hydrocarbon fluids and separates oil, gas and water. The oil must usually be free of dissolved gas before export. Similarly, the gas must be stabilized and free of liquids and unwanted components such as hydrogen sulphide and carbon dioxide. Any water produced is treated before disposal.

Routine operations on a producing well would include a number of monitoring, safety and security programmes, maintenance tasks, and periodic downhole servicing using a wire line unit or a workover rig to maintain production. The infrastructure required for development drilling in onshore operations is similar to that described above for exploration. However, once drilling is completed, the individual wellhead assemblies and well sites are considerably smaller than when the drill rig was on site. Typically, each well requires an area of some 10m² surrounded by a security fence. Often the well sites are concentrated within a central area, which includes processing facilities, offices and workshops. Since the production operation is a long-term development, the temporary facilities used in exploration are replaced by permanent facilities and are subject to detailed planning, design and engineering and construction. A permanent workforce, usually accommodated in the local area, replaces the temporary workforce associated with exploration activity.

1.1.5 Decommissioning and Rehabilitation

The decommissioning may involve removal of buildings and equipment, disposal of wastes, restoration of the site to environmentally-sound conditions and if required implementation of measures to encourage site re-vegetation and continued monitoring of the site after closure. Planning for decommissioning is an integral part of the overall management process and should be considered at the beginning of the development during design.

By their nature, most exploration wells will be unsuccessful and will be decommissioned after the initial one-to-three months of activity. It is, therefore, prudent to plan for this from the outset, and ensure minimal environmental disruption.

1.2 History of Exploration and Production in Pakistan²

The first small scale production well in Pakistan started operations in 1886, in Khattan (Balochistan). In 1915, the first commercial oil discovery was made in the Potwar basin (Punjab). The first major gas discovery amounting to 9.6 Trillion Cubic Foot (TCF) was made in the Central Indus basin by Pakistan Petroleum Ltd. in 1952 at Sui (in Balochistan), following with Esso Stanvac discovery of another giant field, Mari (in Sindh) in 1956.

² Adapted from World Bank (July 10, 2003)

The development of the Central Indus gas discoveries was impeded by the absence of a ready supply and demand market. In light of a non-existent energy market a pipeline was built from Sui to Karachi in the late 1950's, which triggered the development of the first gas market. While the initial discoveries were made by private companies, in the early 1960's, the Oil and Gas Development Company Limited (OGDCL) was created, which developed a successful track record in discovering oil and gas reserves.

Following the oil crisis of 1973, OGDCL and private companies were forced to increase their exploration efforts, which yielded a number of impressive discoveries such as Miano and Sawan with reserves of 2.0 TCF, Qadirpur fields holding reserves of over 4.0 TCF, and Pirkoh with reserves of 2.1 TCF. Meanwhile, to resolve the issue of supply of gas to the country a substantial gas transmission and distribution system was implemented, while two public companies SNGPL³, and SSGCL⁴ were mainly responsible for developing the gas pipeline grid distribution network

As of June 30, 2002, initial recoverable gas reserves (in volume) were estimated at 42 TCF of which 27 TCF remain to be produced. Oil reserves are much more modest with initial recoverable reserves of 765 million bbl and a remaining balance of 300 million bbl. with a reserve to production ratio of 25 years.

While some 550 exploratory wells have been drilled in Pakistan, new fields (some significant) continue to be discovered in established areas; however, in some areas exploration has hardly begun. Given continuous gas shortages, there is a strong case for pursuing the exploration effort vigorously.

1.3 Institutional Aspects

The Directorate General, Petroleum Concessions (DGPC) in the Ministry of Petroleum and Natural Resources is the main agency involved in the upkeep of the petroleum database, the promotion of acreage, the negotiation and award of licenses, and the monitoring of oil companies under contracts. The price at which natural gas is sold to the SNGPL and SSGPL is currently linked to the international crude oil price, but is also subject to the gas pricing policy in effect when the concession was awarded. Since 2002, the actual wellhead price is notified by the Oil and Gas Regulatory Authority (OGRA) twice a year in accordance with production contracts. Various government agencies including the custom and tax authorities, are also concerned with the exploration and development activity, in terms of imported equipment and supplies, and applicable taxation rate on production income.

The E&P activities are also overseen by environmental agencies – Federal and provincial Environmental Protection Agency (EPA). The Environmental Impact Assessment (EIA)

³ Sui Northern Gas Pipeline Limited

⁴ Sui Southern Gas Company Limited

studies are undertaken, air and water emissions monitored, and appropriate effluent disposal and clean up of the site ensured. From the viewpoint of safety of operations, Central Inspectorate of Mines (CIM) provides the necessary oversight. Lastly, as part of the concession agreement with E&P entities, it is ensured by social directorates of the provincial governments that the stipulated investments in health, education and other facilities are made in and around the production area.

2 Potential Impacts and their Mitigation

2.1 Potential Impacts⁵

Oil and gas exploration and production operations have the potential for a variety of impacts on the environment. These impacts depend upon the stage of the process, the size and complexity of the project, the nature and sensitivity of the surrounding environment and the effectiveness of planning, pollution prevention, and mitigation and control techniques. Some generic potential impacts of upstream activities on socio-economic, cultural, atmospheric, aquatic, and terrestrial environment are discussed below. These are also presented in a tabular form in **Annexure A (Exhibits A-1 to A-4)**.

2.1.1 Socio-economic and Cultural Impacts

Exploration and production operations are likely to induce economic, social and cultural changes. The extent of these changes is especially important to local groups, particularly indigenous people who may have their traditional lifestyle affected. The key impacts may include changes in:

- Land use patterns, such as agriculture as a direct consequence (for example land uptake and exclusion) or as a secondary consequence by providing new access routes, leading to unplanned settlement and exploitation of natural resources;
- Local population levels, as a result of immigration (labour force) and in-migration of a remote population due to increased access and opportunities;
- Socio-economic systems due to new employment opportunities, income differentials, inflation, differences in per capita income, when different members of local groups benefit unevenly from induced changes;
- Socio-cultural systems such as social structure, organization and cultural heritage, practices and beliefs, and secondary impacts such as effects on natural resources, and rights of access;
- Availability of, and access to, goods and services such as housing, education, healthcare, water, fuel, electricity, sewage and waste disposal, and consumer goods brought into the area;
- Planning strategies, where conflicts arise between development and protection, natural resource use, recreational use, tourism, and historical or cultural resources;

⁵ Adapted from E&P/UNEP 1997

- Aesthetics, because of unsightly or noisy facilities and transportation systems and associated effects (e.g. noise, accident risk, increased maintenance requirements or change in existing services).

Some positive changes may also result, particularly where proper consultation and partnership have developed. For example, improved infrastructure, water supply, sewerage and waste treatment, health care and education are likely to follow.

2.1.2 Atmospheric Impacts

The primary sources of atmospheric emissions from oil and gas operations arise from:

- Flaring, venting and purging gases;
- Combustion processes such as diesel engines and gas turbines;
- Fugitive gases from loading operations and tankage and losses from process equipment;
- Airborne particulates from soil disturbance during construction and from vehicle traffic; and
- Particulates from other burning sources, such as well testing.

The principal emission gases include carbon dioxide, carbon monoxide, methane, volatile organic carbons and nitrogen oxides. Emissions of sulphur dioxides and hydrogen sulphide can occur and depend upon the sulphur content of the hydrocarbon and diesel fuel, particularly when used as a power source. In some cases sulphur content can lead to odour near the facility.

Ozone depleting substances are used in some fire protection systems, principally halon, and as refrigerants.

The volumes of atmospheric emissions and their potential impact depend upon the nature of the process under consideration. The potential for emissions from exploration activities to cause atmospheric impacts is generally considered to be low. However, during production, with more intensive activity, increased levels of emissions occur in the immediate vicinity of the operations.

2.1.3 Aquatic Impacts

The principal aqueous waste streams resulting from exploration and production operations are:

- Produced water;
- Drilling fluids, cuttings and well treatment chemicals; and process, wash and drainage water;
- Sewerage, sanitary and domestic wastes;

- Spills and leakage; and
- Cooling water.

Again, the volumes of waste produced depend on the stage of the exploration and production process. During seismic operations, waste volumes are minimal and relate mainly to camp activities. In exploratory drilling the main aqueous effluents are drilling fluids and cuttings, whilst in production operations-after the development wells are completed-the primary effluent is produced water.

The make-up and toxicity of chemicals used in exploration and production have been widely discussed in the literature whilst the E&P Forum Waste Management Guidelines summarize waste streams, sources and possible environmentally significant constituents, as well as disposal methods. Water-based drilling fluids have been demonstrated to have only limited effect on the environment. The major components are clay and bentonite, which are chemically inert and non-toxic. The effects of heavy metals associated with drilling fluids (Ba, Cd, Zn, Pb) have been shown to be minimal, because the metals are bound in minerals and hence have limited bioavailability. Oil-based drilling fluids and oily cuttings, on the other hand, have an increased effect; the oil content of the discharge is probably the main factor governing these effects.

The high pH and salt content of certain drilling fluids and cuttings poses a potential impact to fresh-water sources. Produced water is the largest volume aqueous waste arising from production operations, and some typical constituents may include in varying amounts inorganic salts, heavy metals, solids, production chemicals, hydrocarbons, benzene, PAHs, and on occasions naturally occurring radioactive material (NORM). Produced water volumes vary considerably both with the type of production (oil or gas), and throughout the lifetime of a field.

Other aqueous waste streams such as leakage and discharge of drainage waters may result in pollution of ground and surface waters. Impacts may result particularly where ground and surface waters are utilized for household purposes or where fisheries or ecologically important areas are affected.

Indirect or secondary effects on local drainage patterns and surface hydrology may result from poor construction practice in the development of roads, drilling and process sites.

2.1.4 Terrestrial Impacts

Potential impacts to soil arise from three basic sources:

- Physical disturbance as a result of construction;
- Contamination resulting from spillage and leakage or solid waste disposal; and
- Indirect impact arising from opening access and social change.

Potential impacts that may result from poor design and construction include soil erosion. Alterations to soil conditions may result in secondary impacts such as changes in surface hydrology and drainage patterns, increased siltation of surface water bodies and reducing the capacity of the environment to support vegetation and wildlife.

In addition to causing soil erosion and altered hydrology, the removal of vegetation may also lead to secondary ecological problems, particularly in situations where many of the nutrients in an area is held in vegetation; where the few trees present are vital for wildlife browsing; or in areas where natural recovery is very slow.

Due to its simplicity, burial or landfilling of wastes in pits at drilling and production sites has been a popular means of waste disposal in the past. Historically, pits have been used for burial of inert, non-recyclable materials and drilling solids; evaporation and storage of produced water; work over/completion fluids; emergency containment of produced fluids; and the disposal of stabilized wastes. However, the risks associated with pollutant migration pathways can damage soils and usable water resources (both surface and groundwater), if seepage and leaching are not contained.

Soil contamination may arise from spills and leakage of chemicals and oil, causing possible impact to both flora and fauna. Simple preventative techniques such as segregated and contained drainage systems for process areas incorporating sumps and oil traps, leak minimization and drip pans, should be incorporated into facility design and maintenance procedures. Such techniques will effectively remove any potential impact arising from small spills and leakage on site. Larger incidents or spills offsite should be subject to assessment as potential emergencies.

2.1.5 Ecosystem Impacts

Plant and animal communities may be directly affected by changes in their environment through variations in water, air and soil quality and through disturbance by noise, extraneous light and changes in vegetation cover. Such changes may directly affect the ecology: for example, habitat, food and nutrient supplies, breeding areas, migration routes, vulnerability to predators or changes in herbivore grazing patterns, which may then have a secondary effect on predators. Soil disturbance and removal of vegetation and secondary effects such as erosion and siltation may have an impact on ecological integrity, and may lead to indirect effects by upsetting nutrient balances and microbial activity in the soil. If not properly controlled, a potential long-term effect is loss of habitat which affects both fauna and flora, and may induce changes in species composition and primary production cycles.

If controls are not managed effectively, ecological impacts may also arise from other direct anthropogenic influence such as fires, increased hunting and fishing and possibly poaching. In addition to changing animal habitat, it is important to consider how

changes in the biological environment also affect local people and indigenous populations.

2.2 Mitigation Measures

A set of generic mitigation measures for the individual upstream onshore exploration and production activities is provided in **Annexure A** (see **Exhibits A-5 to A-8**). Companies, however, must determine the specific needs of their own operations, including relevant regulatory requirements, and develop suitable environmental management systems and practices necessary to prevent and control environmental impacts. The mitigation measures are drawn from existing environmental assessments; environmental management plans; sectoral guidelines for the industry provided in Pakistan Environmental Assessment Procedures, 1997; and relevant international guidelines.

Exhibit A-9 in **Annexure A** also lists some generic setbacks from environmental receptors as they apply to the individual activities and their components. These setbacks are based on judgement and previous experience and are not definitive in their nature. These setbacks maybe modified in the individual environmental assessments based on local conditions and type of activities.

Part II: Guidelines for Environmental Assessments



3 Environmental Assessments

3.1 Introduction

All development intrinsically involves ‘trade-offs’ between potentially conflicting goals. The challenge is to optimise these trade-offs between and across the three systems basic to development - the ecological system, the economic system and the social system (Barbier, 1987; Holmberg *et al*, 1991 as cited in IIED September 1998). Environmental Assessment’s (EA) are used as a tool to identify the biophysical and social impacts of development and how these will be mitigated so that the process of decision-making is balanced and the development options under consideration are environmentally and socially sound and sustainable.

In Pakistan the process of EA’s is nascent. Although the PEPA 1997 makes it mandatory for all projects to proceed only after an environmental approval, conformance to the law by all projects is yet to be fully seen. The upstream petroleum sector has been the most vigilant sector to date in conforming to the PEPA 1997 requirement for EA’s. But in the past few years numerous issues, concerns and queries have been raised from the stakeholders, practioners, and the proponents regarding the applicability, scope, type, contents, quality, and implementation of the EAs e.g. Can an EIA cover more than one project? Can an EA be undertaken at an early stage when project locations have not been finalised? EAs are becoming too similar and repetitive and appear to be “cut and paste jobs”; there is little public involvement and interest left in the EA process; EA is looked at as an activity and not as a process and hence implementation of the EA is weak.

The guidelines provide a framework for the preparation, submission and approval, and monitoring of EA’s for the upstream petroleum sector. The framework is based on the IEE and EIA Review Regulations 2000 (the 2000 Regulations), the Pakistan Environmental Assessment Procedures 1997 (PEAP 1997) and relevant international guidelines. The guidelines avoid repetition and overlap with previous work (such as the PEAP 1997) and therefore address only issues specific to the upstream petroleum sector.

3.2 EA Requirement and Scope of EA’s

EA’s are a requirement for all upstream sector projects including:

- Seismic surveys (2D and 3D)
- Exploration, appraisal or production drilling
- Well testing, completion, and work over.

- Pipeline and flow line
- Processing plants

Within these activities EA's will cover the entire life cycle starting including: mobilisation, construction (or camp set up), commissioning, operation, upgrades, and restoration.

3.3 Types of EA's

The PEPA 1997 recognises two types of environmental assessments:

- Initial Environmental Examination (IEE)
- Environmental Impact Assessment (EIA)

Developments in the field of EA's now include a broad suite of different techniques, including social impact assessment (SIA), cumulative effects assessment (CEA), environmental health impact assessment (EHIA), strategic environmental assessment (SEA) and biodiversity impact assessment (BIA) {IIED September 1998}. Most of the EA's in Pakistan for the upstream petroleum sector have included some or a combination of these techniques in an integrated EA report. However, the use and understanding of these techniques needs to be further promoted and strengthened in future.

Strategic or programme level EA's and CEA will be used for EA's covering multiple upstream projects and every EA will include SIA, EHIA and BIA as part of its assessment of impacts on biological and social environment. Relevant guidelines that will assist the EA practioners for use of these techniques are given in **Annexure C (Exhibit C-1)**.

3.4 Timing of EA's

The EA should be commissioned well before the planned execution of a project. The proponent should keep into consideration the lead-time required for the tendering, commissioning, preparation, review and decision of an EA; some allowance should also be kept for contingencies. The lead-time will depend on the scope of the EA, the sensitivity of the project area and the time required by EPA to give its decision (which can be maximum of 4 months).

3.5 The EA Life Cycle

This section describes the main elements of a life cycle of an IEE and an EIA; emphasising on details that are specific to the upstream projects. Generic details of these elements are given in more detail in the 2000 Regulations; PEAP 1997; and other guidelines and textbooks.

Simplified process flow diagrams have been shown separately for IEE and EIA in **Exhibit 3-1** and **Exhibit 3-2** respectively.

Phase I: EA Planning

a. Screening (IEE or EIA)

The first step in the preparation of an EA is to determine the type of EA required i.e. an IEE or an EIA. According to the 2000 Regulations all upstream exploration and production projects outside environmentally sensitive areas require an IEE, and all projects in environmentally sensitive areas require an EIA⁶.

Screening should occur as early as possible in the development of a project so that proponents are aware of their obligations at an early stage.

Proponents, EA practitioners and reviewers are, however, cautioned against solely adopting a mechanistic approach to the screening process. An IEE for a project can identify significant issues that warrant detailed primary data collection, public consultation and thus an EIA. Based on the findings of the IEE the EPA under clause 12 (2a) of PEPA 1997 can direct a proponent to submit an EIA, if it so warrants. The decision to undertake an EIA can also be made voluntarily by the proponent in consideration of good practices or corporate requirements.

b. Scoping

Scoping refers to the process of identifying, as early as possible:

- Appropriate boundaries of the environmental assessment (the entire concession, the radius around the well site, extent of the seismic programme)
- Important issues and concerns
- Information necessary for impact assessment
- Significant impacts and factors to be considered

The process of scoping applies to both IEE and EIA but is more important for an EIA due to the complexity of issues involved. For an IEE, scoping can be simply by means of planning meetings using available secondary information, experience and local knowledge prior to starting the IEE

The scoping process serves to facilitate an efficient EIA process by identifying key issues, concerns and alternatives that require investigation. It will also reduce the likelihood that the EIA document will have serious deficiencies, and the attendant delay if it needs to be revised. The scope of the EIA can be modified during the EIA as more information becomes available. It is important to note however, that scoping should be done preferably before site visit to avoid leaving any information from being collected.

⁶ Guidance on the type and location of environmentally sensitive areas in Pakistan is provided in Part IV of the Guidelines.

Commonly, scoping is considered to be completed when a document often in the form of a Terms of Reference (ToR) is produced setting out what the EIA is to cover and how it is to be managed. Experience shows that Terms of Reference and consequently should not be rigid documents. They need to be flexible enough to either increase or decrease the scope of investigations as new issues emerge or others are reduced in importance.

Phase II: EA Preparation

The EA preparation involves gaining appreciation of the project, legal requirements, and baseline conditions; identifying and predicting impacts; and recommending mitigation measures. These elements of the EA are explained in more detail in Section 4.6 of the Chapter.

Phase III: EA Reporting

The IEE or the EIA are finally compiled in a report form for review, submission and approval. Detailed guidelines on reporting are given in the Pakistan Environmental Assessment Procedures, 1997. Typical table of contents for an IEE and an EIA and typical shortcomings to be avoided in EA reports are provided in **Exhibit 3-3** and **Exhibit 3-4**.

Phase IV: Submission

Once the EA is internally reviewed and accepted by the proponent, 10 hard copies and 2 soft copies of the EA will be submitted to the relevant EPA (s)⁷. The 2000 Regulations specify the EA submission to be accompanied with an EA review fees and a duly filled Schedule III and IV form (see **Annexure C: Exhibit C-2** and **Exhibit C-3**).

Phase V: Preliminary Scrutiny by EPA

After filing of the EA with the relevant EPA, the EPA will within 10 days of the filing of the EA confirm that the EA is complete for purpose of initiation of the review process. The purpose of the preliminary scrutiny will be to identify at an early stage any major omissions or errors such as: the correct type of EA is not undertaken (i.e. an IEE rather than an EIA is done for a project in an environmentally sensitive area); the EA is incomplete in its contents and form (e.g. public consultation or review of alternatives not done for an EIA); or there is insufficient baseline data or impact assessment for review and decision purposes. If an EA is considered incomplete, the EPA will require the proponent to submit the required additional information.

Phase VI: Review and Decision by EPA

The formal review of the IEE or the EIA will start 10 days after filing of the IEE or the EIA report, regardless of whether or not the EPA has confirmed the completeness of the IEE or the EIA for review purposes.

⁷ See section 4.7 for projects with cross provincial coverage

The review process for IEE and EIA is separately detailed below:

a. Review and Decision Process for IEE

The EPA will make every effort to complete its review of the IEE within 45 days of the issue of confirmation of completeness or 55 days of the filing of the IEE (if the confirmation of completeness is not issued by the EPA). In the review process the EPA may consult a Committee of Experts⁸, which may be constituted on the request of the Director General (DG) EPA. The DG EPA may, where he considers it necessary, also constitute a committee to inspect the site of the project and submit its report on such basis as may be required. On completion of the review process, the decision of the EPA will be communicated to the proponent in the form prescribed in Schedule V (see **Annexure C: Exhibit C-4**). Where an IEE is approved, the EPA can impose additional controls as part of the conditions of approval.

The EPA will communicate its decision within a maximum of 4 months from the date of filing of the IEE. The approval will remain valid for the project duration mentioned in the IEE but on the condition that the project commences within a period of three years from the date of approval. If the project is initiated after three years from approval date, the proponent will have to apply for an extension in the validity period. The EPA on receiving such request grant extension (not exceeding 3 years at a time) or require the proponent to submit a fresh IEE if in the opinion of the EPA changes in baseline conditions or the project so warrant.

b. Review and Decision Process for EIA

The EPA will make every effort to complete its review of the EIA within 90 days of the issue of confirmation of completeness or 100 days of the filing of the EIA (if the confirmation of completeness is not issued by the EPA). The EPA will (simultaneously with the issuance of confirmation of compliance or within 10 days of filing of the EIA) publish a public notice in any English or Urdu national newspaper and in a local newspaper of general circulation in the area affected by the project. The public notice will mention the following:

- The type of project
- The location of the project
- The name and address of the proponent
- The places at which the EIA can be accessed
- The date, time and place for public hearing of any comments on the project or its EIA

⁸ See clause 23 of the IEE and EIA Review Regulations, 2000 for the roles and composition of the Committee

The date set for public hearing will not be earlier than 30 days from the date of publication of the public notice. The EPA will also circulate copies of the EIA to the concerned government agencies. The EPA in granting its decision on the EIA will consider comments received during the review process.

In the review process the EPA may consult a Committee of Experts, which maybe constituted on the request of the DG EPA. The DG EPA may, where he considers it necessary, also constitute a committee to inspect the site of the project and submit its report on such basis as maybe required.

On completion of the review process, the decision of the EPA will be communicated to the proponent in the form prescribed in Schedule VI (see **Annexure C: Exhibit C-5**). Where an EIA is approved, the EPA can impose additional controls as part of the conditions of approval.

The EPA will communicate its decision within a maximum of 4 months from the date of filing of the EIA. The approval will remain valid for the project duration mentioned in the EIA but on the condition that the project commences within a period of three years from the date of approval. If the project is initiated after three years from approval date, the proponent will have to apply for an extension in the validity period. The EPA on receiving such request grant extension (not exceeding 3 years at a time) or require the proponent to submit a fresh EIA if the in the opinion of the EPA changes in baseline conditions or the project so warrant.

Phase VII: Acceptance of Approval and Confirmation of Compliance

After receiving approval from the EPA the proponent will acknowledge acceptance of the conditions of approval by executing an undertaking in the form prescribed in Schedule VII of the Regulations (see **Annexure C: Exhibit C-6**). The 2000 Regulations also require proponents to obtain from the EPA, after the end of construction phase of the project, a confirmation that of the requirements of the IEE or the EIA and the conditions of approval have been duly complied with. This requirement will only be applicable to processing plants and not applicable for seismic, drilling and pipeline projects, which do not involve any major construction works.

In order to obtain the confirmation of compliance for construction phase of processing plants, the proponent will furnish an end-of-construction report to the EPA stating compliance with the requirements of the IEE or EIA and conditions of approval. The EPA in granting the confirmation of compliance may impose any additional control regarding the environmental management of the project or the operation, maintenance and monitoring of the project, as it deems necessary. The EPA will issue a confirmation of compliance within 15 days of the receipt of the report, after which the proponent's request for confirmation of compliance shall be deemed to have been accepted by the

EPA. The commissioning and operation of the processing plant can continue during the period in which the confirmation of compliance is being sought.

Phase VIII: IEE or EIA Implementation, Monitoring, and Reporting

The IEE or EIA process does not end at the approval stage, but continues till the end of the project in the form of implementation of the IEE or EIA requirements, and monitoring and reporting as set out in the IEE or EIA environmental management plan. Detailed guidelines related to the preparation of environmental management plans and monitoring and reporting of upstream projects are provided in Chapter 5 and Chapter 6 of Part III of the Guidelines.

Phase IX: Project Closure and Post-project Monitoring and Reporting

The IEE or EIA life cycle will end with the closure of the project, restoration of the area, and any required post-project monitoring and reporting. Requirements related to post-project monitoring and reporting are given in Chapter 6 of Part III of the Guidelines.

3.6 Guidelines for Preparation of IEE and EIA

3.6.1 Project Appreciation

Gaining a clear understanding of the proposed project allows the consultant to clearly identify all activities in a project and understand their consequences. The EA will cover the entire life cycle of a project including design, construction, commissioning, operation, maintenance, and restoration.

The definition of the project, for which the proponent is seeking decision, is important as experience has shown that at times projects are not fully defined and hence only those components of the project are approved which are included in the EA e.g. if an EA is commissioned for an exploration well, the proponent should include possible use of the well as a production well in case of a commercial discovery and the need for work over or other maintenance activities throughout the life of the well.

The proponent will be responsible for providing complete details of a project to the consultant in a non-technical manner, if the consultant so requires. A typical list of details that might be required for and reported in an EA is provided in **Annexure C (Exhibit C-7)**.

3.6.2 Appreciations of Legal Requirements and Standards

It is important for the EA to identify all legal requirements, guidelines and best practices related to the project; evaluate compliance; recommend measures for compliance where non-compliance is possible; and in case where non-compliance cannot be totally avoided

assess significance of non-compliance and its affects and recommend mitigation or compensation measures.

A detailed description of the laws, conventions and best practices that may apply to the industry is given in **Annexure B** of the guidelines. However, it is still important for the EA consultant to have a strong knowledge of the local laws, international conventions, best practices and their relevance to the project. Legal requirements can be related to not only conducting EA's and NEQS but also to use of natural resources etc., which are sometimes easy to overlook. To avoid this, consultation should be done with government and non-government agencies who can help identify any legal requirements that may apply to the project e.g. irrigation department for use of canal water; revenue department for leasing of lands; building and roads department for use of existing public roads etc.

It is also necessary to view legal requirements in their right context e.g. if noise levels from vehicles are specified as 85db at 7.5m from the source, these maybe applicable for cities, towns and not for remote, isolated areas where no social or biological sensitivity exists. In cases of ambiguity or conflict in interpretation of a legal requirement, advice should always be sought from the custodian government authority.

It is generally accepted as a good practice and soft-obligation to follow widely accepted guidelines such as the World Bank and OGP guidelines (or corporate guidelines) in situations where: local laws and regulations are absent (e.g. there are no regulations in Pakistan yet on the management of solid wastes and no regulations specific to the oil and gas exploration and production wastes) or the guidelines provide a more effective means of mitigating, managing and monitoring the impacts. In instances where guidelines and local laws conflict, compliance with local laws will prevail.

3.6.3 Baseline Data Collection

The change caused by a particular impact can be evaluated by comparing the expected future state of environmental components if the proposal were not to go ahead (the baseline condition for the no-development option) with the predicted state of those components if the project does proceed. Therefore one of the first tasks involved in the detailed analysis of an impact is the collection of baseline information regarding the physical, biological, socio-economic, cultural and archaeological environment of the project area.

The following things should be considered in data collection:

a. Spatial variation and coverage

Environmental conditions may vary spatially (such as topography, wildlife etc) and hence reporting such variations would be necessary for general appreciation of the area. The study area for any environmental receptor would depend on the spatial variability of the

receptor, spatial spread of the project, and anticipated spatial spread of the associated impacts. The study area would therefore need to be carefully selected before commencement of fieldwork and modified during fieldwork as more data becomes available.

b. Temporal variation, coverage and validity

Environmental conditions may vary temporally (such as water availability and quality, wildlife distribution and abundance etc) and hence understanding and reporting such variations are necessary for impact assessment. Certain receptors are more prone to temporal changes than others e.g. water availability in comparison to soils or geology. The EA should identify and address temporal variations in environmental conditions and changes in impacts with the changing environmental condition e.g. impacts of a project on wildlife may be significant only during lambing season and insignificant otherwise.

For major projects with a life cycle spread over years it is likely that the current baseline conditions will no longer apply during the entire life cycle of the project. In these cases predictions have to be made about the future environmental conditions, requiring additional data and use of models or other sophisticated forecasting techniques. Exploration projects have a short life cycle (such as a seismic survey which may finish in a few months) and hence long term data collection or the use of sophisticated forecasting techniques will not be required. However, for processing plants (and other projects or facilities that may have a long term use), which can have a life of 10-20 years, impact assessment should be based on existing baseline conditions and foreseeable future trends with a condition of reviewing efficacy of impacts every year⁹.

c. Source of data and methods of data collection

Understanding of the project area environment can be gained on the basis of both secondary and primary data. Sources of secondary data can include government departments; universities and research organisations; Internet sites; NGO's; libraries; professionals etc. Identifying the secondary data needed is important as it is difficult to search and collect secondary data from most of the organisations and valuable time can be wasted collecting data that is not required. All secondary data will be validated for its authenticity by cross-checking from other sources and all secondary data used will be properly referenced. Where existing data is used, its adequacy and appropriateness for impact assessment of the proposal will be reviewed and discussed. Shortfalls or uncertainty of knowledge will be clearly identified.

Primary data is needed to ground-truth secondary data and collect additional first hand data where secondary data is not available. Where baseline data is to be collected first hand, careful consideration must be given to the design of the sampling program.

Matters to consider include:

⁹ Reassessment of impacts can be done in the yearly monitoring report required for processing plants

- Degree of understanding of the processes in question
- Reasons for the data collection program
- Sampling program design
- Data collection procedures
- Data analysis methodologies
- Relevant quality assurance procedures.

In the preparation of an IEE, much reliance can be made on secondary data (which is recent, valid and authentic) but field observations would be needed for ground-truthing of secondary data and for collecting additional data where secondary data is not available. For certain repeat-IEE's in the same area the need for primary data maybe minimal.

d. Contents

The level and extent of data on baseline conditions required for an EA depends on: the sensitivity of the environment; the anticipated significance of the impact; and the level of accuracy required in impact prediction. It is not solely on the type of the EA (some IEE's also involve detailed data collection if a need is justified). The level and extent of data required for an EA is usually defined in the scoping study.

There is no hard and fast rule for defining the minimum requirements for data collection on the baseline environmental conditions and hence a definitive list of data to be collected and reported for an IEE and an EIA cannot be produced.

In reporting baseline conditions the approach will be to provide a general understanding of the area, specific detailed information on key sensitive features (which maybe water, wildlife or communities) and sufficient information to enable full and effective assessment of impacts.

IEE's will avoid producing separate and voluminous chapters on baseline conditions and would rather discuss the baseline conditions in relation to the anticipated impacts. EIA's will also collect detailed data only on those issues, which are considered significant. Collecting, and reporting data, which has no use, is a waste of time, resources and money.

3.6.4 Public Consultation

Public consultation is a mandatory part of an EIA. Separate guidelines have been prepared for public consultation and presented in **Part IV** of the Guidelines.

3.6.5 Review of Alternatives

Alternatives are generated and examined to determine the best method of achieving project objectives, while minimising environmental impacts (WB December 1996). Alternatives that are generally reviewed for oil and gas exploration projects are alternative site, timing, technology etc. The analysis of some of the alternatives is not as exhaustive or strategic as would be required for public sector projects as the decision to explore for oil and gas is already made at the state policy level and also because alternative means of energy, which could fully replace oil and gas, do not exist at this stage. In some instances there will be an overlap between alternatives and mitigation measures, as alternative design, location, timing are also a way of impact mitigation.

3.6.6 Impact Identification and Prediction

Generic impacts from upstream exploration and production activities have been discussed in Part I of the Guidelines. However, this not a definitive list and the EA will identify and address any additional project or site-specific impacts that may arise. Various methods are available for the identification of impacts including matrices, networks, overlays, geographic information systems, and professional experience. A comparative evaluation of these methods is provided in the PEAP 1997.

Once the range of impacts has been identified, the characteristics of each impact must be predicted including magnitude; likelihood; reversibility; extent; timing; and duration. Although prediction may employ mathematical models, photomontages, physical models, socio-cultural models, economic models, and experiments, generally upstream exploration and production operations can be effectively predicted based on expert judgments supported by available primary and secondary data. However, where required (for certain significant impacts such as long term use of water, impacts on rare or threatened wildlife species) possible impacts will be predicted quantitatively.

Once impacts have been analysed, it is important to determine their significance, that is, whether they are acceptable, require mitigation, or are unacceptable to the community. Various means of assigning significance to an impact are discussed in the Pakistan Environmental Assessment Procedures, 1997. It should be noted that assessing the significance of issues and their relative importance always remains to be subjective. Even the apparently scientific establishment of environmental discharge standards will have involved the balancing of environmental quality and economic reality. The approach used to determine significance must take into account the cultural and social aspects of local value systems and traditional practices.

3.6.7 Mitigation Measures

A generic list of recommended mitigation measures for the Upstream E&P industry is given in Part I of the Guidelines. However, there can always be a need for identifying

site or project specific mitigation measures, following the principles detailed in the Pakistan Environmental Assessment Procedures, 1997 and other industry guidelines and codes of practices discussed in Part II of the Guidelines.

3.7 Projects with Cross Provincial Coverage

There can be cases where a project or its associated impacts have a cross-provincial coverage e.g. a well site in one province might be accessible only from another province or a project in one province but close to a provincial boundary might affect communities or wildlife present in the adjoining province. The Pakistan Environmental Assessment Procedure, 1997 details the jurisdiction and authority of federal and provincial EPA's in reviewing and approving such projects. The proponent will consult with the provincial EPA's at an early stage of the project to clarify the IEE or the EIA preparation, submission, review and approval process.

The IEE or the EIA for projects with cross provincial coverage will clearly indicate project activities and/or impacts in each province separately for ease in review and decision by the EPAs. The EPAs can give separate approvals for the activities that fall within their respective province, however, where activities in one province can affect environmental conditions in the adjoining province, consultation and agreement between the EPA's will be required before decision is granted. Where agreement cannot be reached, the decision of the Federal EPA will prevail. The Province may appeal against the decision of the Federal EPA in the manner prescribed in PEPA 1997.

It might also happen that a cross provincial project covers a protected area in one province and a non-protected area in the other province. For such projects an EIA can be prepared for the part of the project inside the protected area and submitted to the provincial EPA under whose jurisdiction the protected area falls and an IEE prepared for the remaining part of the project in the other province and submitted to the concerned provincial EPA. In such cases the decision by the EPAs should again be consultative and Federal EPA will intervene where an agreement between the provincial EPA's cannot be reached.

3.8 Level of Project Information Required in EA's

In upstream exploration and production projects, location and designs of projects change or develop as more and more geological data is obtained. Because EA preparation and approval can take up to 6-8 months, in order to meet commitment dates or production targets EA's may need to be commissioned at an early stage when the project information is not complete.

IEE's can be commissioned on the basis of broad and generic project information, but will need to cover all possible impacts and their mitigation in all environmental regimes in the area.

To the extent possible, EIA's will be based on detailed and firm project information including location, timing, duration, natural resource use etc. However, there may be exceptions (such as projects in homogenous environments, projects in low sensitivity areas etc) which will need to be discussed with the EPA.

3.9 EA's for Multiple Projects – Programme Level EA's

Most upstream projects are short term in nature; have strict start and completion dates; are similar in terms of the activities and impacts; are defined (in terms of location and other specific details) late in the project cycle owing to reliance on availability of geological data from other on-going projects; and maybe repetitive (e.g. drilling projects each year). EA's for individual upstream projects can therefore be repetitive and look like "cut and paste" jobs. These EA's also do not take into account the cumulative impacts of individual projects and are also impractical where the preparation and approval process cannot be staggered for multiple interlinked projects (e.g. drilling based on the results of the seismic operation).

IEE's and EIA's for multiple projects can be undertaken where possible and where required, allowing proponents to seek conditional approval for multiple planned or committed projects in a window of 3 years. The conditional approval will require the proponent to prepare a project specific environmental management plan for each individual project and submit it to the EPA for approval.

This approach will have the benefit of allowing cumulative assessment of impacts, strategic environmental planning focusing on key issues, and omission of repeat work. However, the EPA will reserve the right to disallow EIA for multiple projects if it deems necessary in lieu of public concerns, sensitivity of the protected area, and lack of confidence on the impact assessment and proponent's compliance with the EIA requirements.

EA's for multiple projects will cover the following:

- All committed or planned projects in the window of 3 years (including gravity surveys, seismic surveys, exploration drilling, pipelines, processing plant installation and up-gradation)
- The anticipated locations/areas where these projects may occur (or the entire concession or a part of it)
- All sensitivities within the study area (and a sensitivity map)
- All reasonably foreseeable impacts from the projects (based on these guidelines and any other project or area specific impacts) on physical, biological, social, and cultural environment
- Cumulative effects assessment of the projects

- Mitigation measures for various environmental zones and sensitivities (based on standard practices given in these guidelines or any additional mitigation measures)
- Framework for environmental management, monitoring and reporting (see details provided below)
- Conclusion (as to whether an EIA is required or not)

The EA will be based on primary and secondary data. As the EA will cover a large area with possibly varying sensitivities the IEE team will be multi-disciplinary; a typical team may comprise environmentalist; biologists; sociologists and water resources experts.

The project information can be sketchy at early stages of the projects but will include as much specific information as possible. If locations/areas of projects are not firm the EA will cover large areas and all environmental zones within the area and the possibility of projects within any environmental zone.

Cumulative effects assessments will be done for all key sensitivities (which may include wildlife, vegetation, water or communities). For mitigation measures, any project or area specific mitigation measures will be identified and a framework for environmental management and monitoring will be prepared.

The EA will be submitted to the concerned EPA for review and decision. The submission, review and approval will follow the steps outlined in earlier sections of this Chapter. The EA will clearly mention the projects for which approval is being sought i.e. number of wells, line kilometre of 2-D seismic, area of 3-D seismic etc.

If the EPA grants approval, it will be based on the condition that an EMP will be prepared for each individual project and submitted to the EPA for approval at least 3 weeks prior to project implementation.

The scope of each EMP will be limited to the project and the project area/location for which the EMP is being prepared. For the EMP exact details of the project and the project area/location will be mandatory. The EMP will be based on site-specific field data, which will not be as extensive as the field data collected during the EA but will be mandatory to cover site-specific sensitivities and any temporal variations in environmental conditions.

Each EMP will be submitted to the concerned EPA. The EPA may forward the EMP to a advisory committee or to key stakeholders for review and comments. The EPA will forward its comments, if any, on the EMP within 3 weeks of the submission date, after which the EMP will be deemed to have been approved.

The proponent will be responsible for monitoring/auditing and reporting as per the guidelines provided in this document and any other requirements laid out in the environmental approval.

3.10 Use of GIS in EA's

GIS can be used as a tool in EA's for collecting and systemising baseline data and identifying, predicting and monitoring impacts. Using GIS to plan and manage large volumes of spatial primary and secondary data collected during baseline studies can not only reduce cost and time but also improve the overall quality of the EA (WB January 1995, WB April 1993). Overlays prepared on the basis of baseline data, satellite imagery and existing maps can be used for sensitivity analysis, impact identification and prediction and monitoring.

3.11 Management of Change

A project after approval from the EPA might have to undergo changes or additions prior to or during execution. Similarly modifications will need to be made to the EA or the EMP in light of any changes in the project or changes in baseline environmental conditions. The proponent and the consultant will, as much as possible, envisage any changes at an early stage of the project and include these in the EA preparation but at the same time allow enough flexibility in the EA to be able to cover these changes after approval of the EA, whilst addressing all legal and best practice requirements.

The EMP for the EA will include a change management plan for the management of changes or additions to the project or the EA/EMP. Significant changes will require approval from EPA, whereas minor or insignificant changes can be implemented - after a proper assessment of the impacts and mitigation measures associated with the change - and the change and its associated impacts and mitigation management reported to the EPA for information and record purposes.

The significance of a change will vary and depend on the level and type of change and the anticipated associated impacts. A change management plan will be therefore specific to a project and will be reviewed and approved by the EPA. Some examples of significant and in-significant changes are shown in **Annexure C (Exhibit C-8)**.

Significant changes that are submitted to the EPA for approval will be in a report form including a description of the proposed change; the need for the change; the impacts associated with the change; mitigation measures that will be taken to minimise or avoid impacts; and any monitoring that may be required. The EPA will give its decision on the change within two weeks of the submission of the report; after which the change will stand approved.

Exhibit 3-1: Process Flow Diagram for IEE

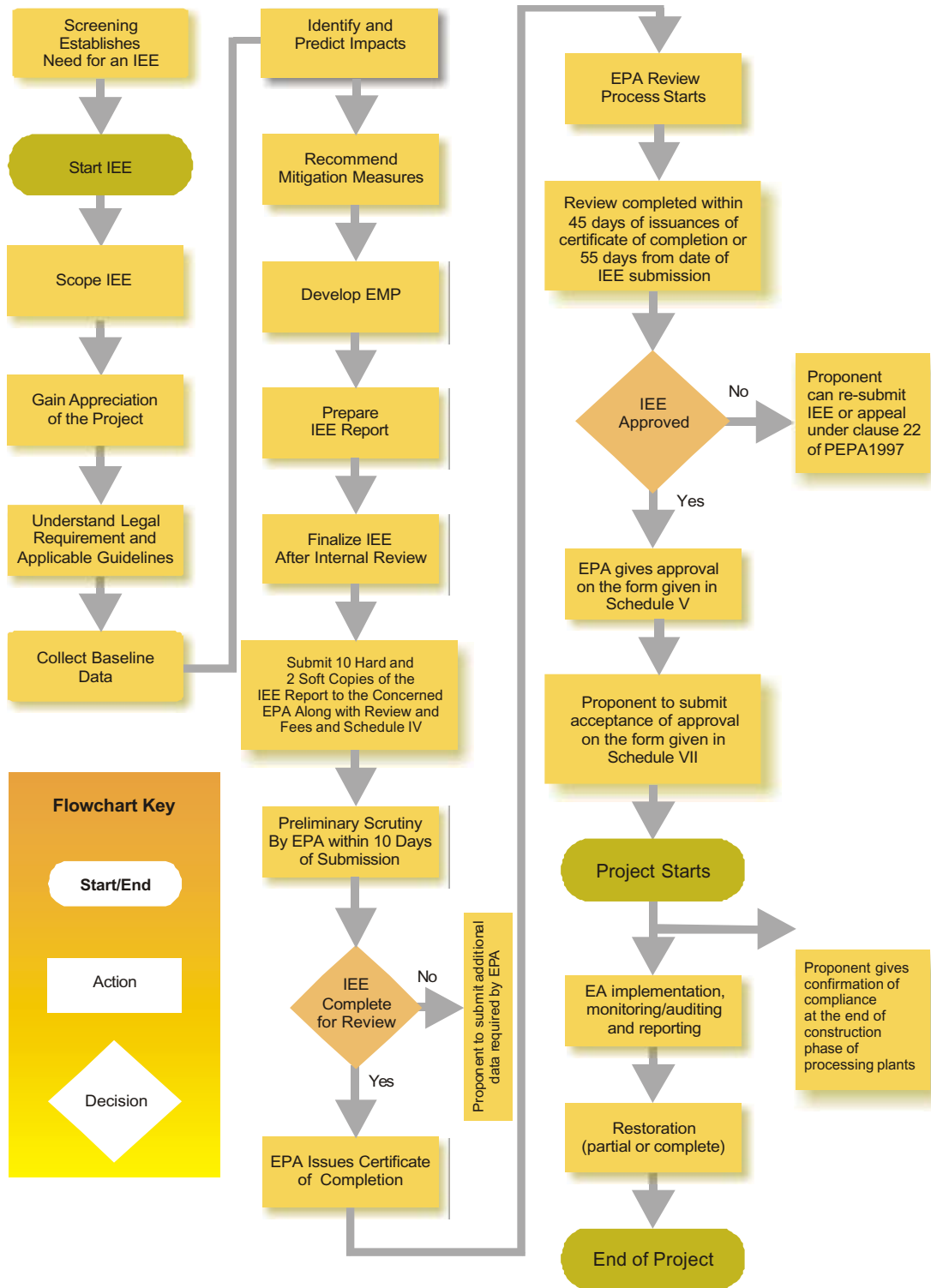


Exhibit 3-2: Process Flow Diagram for EIA

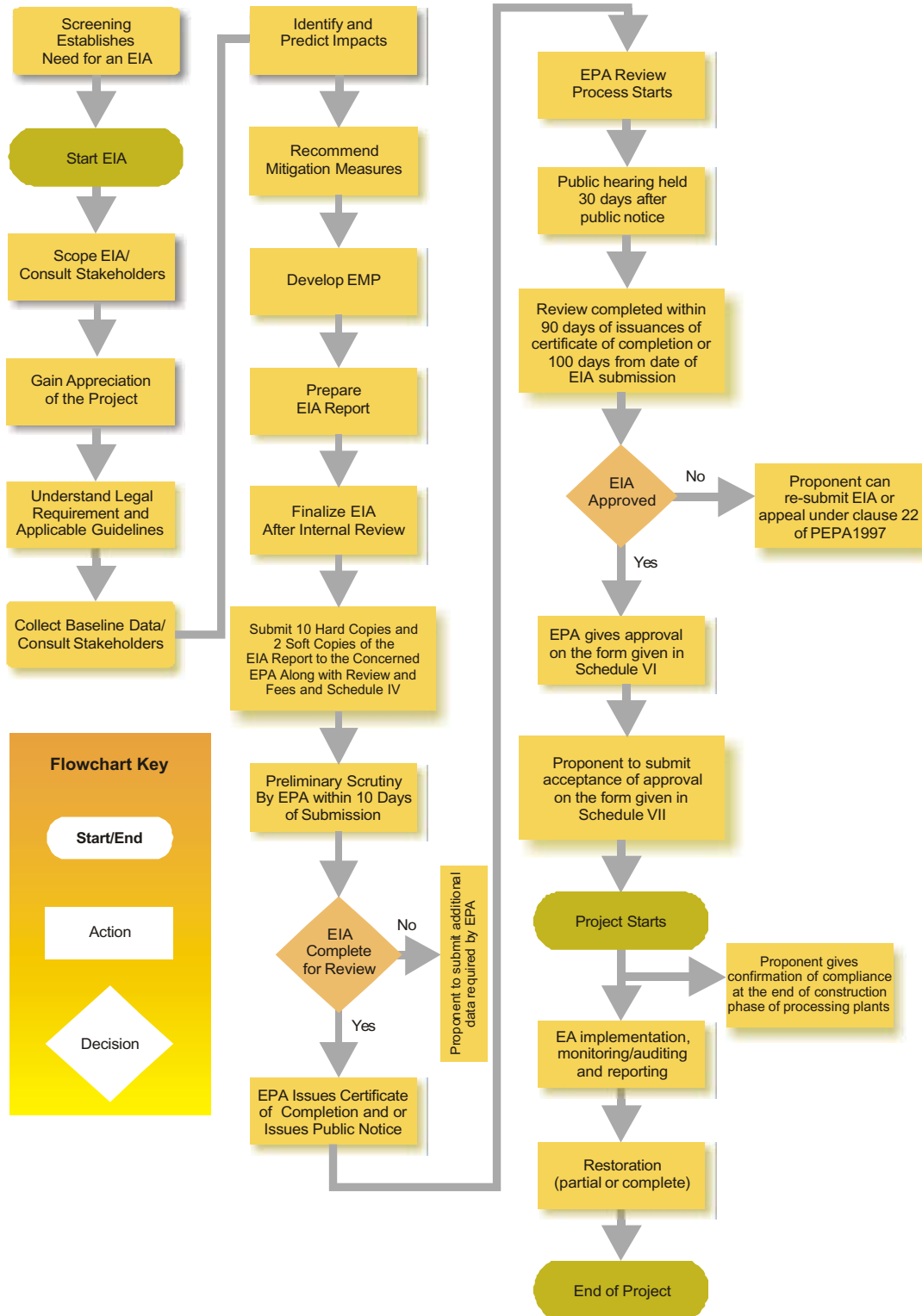


Exhibit 3-3: Table of Contents for IEE's

| No. | Title |
|------------|---------------------------------------|
| 1 | Executive Summary |
| 2 | Introduction |
| 3 | Proposed Project |
| 4 | Statutory Requirements and Guidelines |
| 5 | Potential Impacts and Mitigation |
| 6 | Conclusion |
| Appendix A | Environmental Management Plan |
| Appendix B | Supporting Data |

Exhibit 3-4: Table of Contents for EIA's

| No. | Title |
|------------|---------------------------------------|
| 1 | Executive Summary |
| 2 | Introduction |
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| 4 | Statutory Requirements and Guidelines |
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| 8 | Potential Impacts and Mitigation |
| 9 | Conclusion |
| Appendix A | Environmental Management Plan |
| Appendix B | Supporting Data |

4 Environmental Management Plans

4.1 Environmental Management Plans

An environmental management plan (EMP) is a document designed to ensure that the commitments in the EA, subsequent review reports, and environmental approval are fully implemented (WB January 1999). The EMP is submitted along with the EA report. For EA's that cover multiple projects the EMP submitted with the EA will be generic followed by project specific EMP's submitted to the EPA prior to the implementation of individual projects.

EMP will provide a framework for managing or mitigating environmental impacts throughout the life of the project. It will also make provision for monitoring/auditing the effectiveness of the proposed environmental protection measures and procedures. EMP's should be dynamic, flexible, and subject to periodic review.

4.2 Objectives of EMP's

EMP's are prepared with the objective of:

- Summarizing the project activities and the associated impacts
- Outlining legal requirements and best practices that apply to the project
- Developing a plan for mitigation management
- Identifying monitoring and auditing requirements
- Defining roles and responsibilities of the project proponent and its contractors
- Developing a plan for environmental monitoring, auditing and reporting
- Prescribing the mechanism through which public consultation will continue during the project
- Developing a programme for training of project crew on the implementation of the EMP.

4.3 Components of EMP

4.3.1 Project Summary

EMP's submitted with the IEE or EIA will include the executive summary of the IEE or the EIA so that the EMP can be used as a standalone document. EMP's that are submitted for individual projects following approval of the parent IEE or EIA (covering

multiple projects) will in addition to the summary of the project activities, include changes in baseline conditions and any additional impacts.

4.3.2 Statutory Requirements

The EMP will include a tabulated summary of laws and guidelines applicable to the project.

4.3.3 Institutional Arrangements

A project organization chart will be included with clear roles and responsibilities of environmental management and monitoring by the proponent, contractors and any third parties. For every project there will be a dedicated representative from both the proponent and the contractor to monitor and ensure compliance with the IEE/EIA requirements.

4.3.4 Mitigation Management Plan

Mitigation management plan is a tool for facilitating implementation and monitoring of mitigation measures required by the EA. The plan will include:

- The required mitigation measures recommended in the EA.
- The person/organisation directly responsible for adhering to or executing the required mitigation measures.
- The person/organisation responsible for ensuring and monitoring adherence to the mitigation measures.
- The parameters, which will be monitored to ensure compliance with the mitigation measures.
- The timing at which the mitigation or monitoring has to be carried out.

A sample format for the mitigation management plan is attached in **Exhibit 4-1**.

4.3.5 Environmental Monitoring and Reporting Plan

The EMP will establish the requirements for monitoring and reporting adherence to the EMP and the actual or residual impacts of the project on sensitive receptors and provide a plan for following the monitoring requirements. Details related to environmental monitoring and reporting relevant to upstream projects are provided in Chapter 6 of Part III of the Guidelines.

4.3.6 Consultation Programme

For certain projects (especially those located in environmentally sensitive areas), consultation with key stakeholders (such as communities, regulators and NGO's) maybe required during project implementation. The EMP will develop a consultation

programme based on the guidelines on public consultation provided in Part IV of the Guidelines. The consultation programme will include the stakeholders to be consulted, the timing and frequency of consultation, and the consultation technique.

4.3.7 Management of Change

The EMP will include a change management plan to cover changes to the project or to the EMP. The basis for and the contents of a change management plan are discussed in Section 4.11.

4.3.8 Training Programme

The key objective of the training programme will be to ensure that the requirements of the EMP are clearly understood and followed throughout the project. The awareness provided to the staff will help in communicating environmental related restrictions specified in the EA. The programme will include:

- Objectives of the programme
- Topics (waste management, safe driving, handling of oil etc)
- Persons responsible for providing training to the project crew
- Frequency of training
- Feedback and monitoring mechanism to ensure adherence to and benefits of the programme
- Material that will be used for training

4.3.9 Emergency Response Plan

An emergency response plan will be included in the EMP that details the response to emergencies such as oil spills, H₂S release, well blow-out etc.

4.3.10 Restoration Plan

A plan for the restoration of the project facilities including: the facilities that will be restored; timing of restoration; and restoration method.

Exhibit 4-1: Sample Mitigation Management Matrix

| No. | Mitigation Measure | Responsibility | Timing | Monitoring Parameter |
|------------|---------------------------|-----------------------|---------------|-----------------------------|
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5 Environmental Monitoring, Auditing and Reporting

5.1 Environmental Monitoring

5.1.1 Need and Benefits¹⁰

Environmental monitoring is the planned, systematic collection of environmental data, which can be used to serve the following purposes:

- Augment knowledge on environmental baseline conditions during project execution
- Assess performance and monitor compliance with agreed conditions specified in the EA or the Environmental Approval for a project
- Review predicted impacts in order to effectively manage risks and uncertainties
- Identify trends in impacts
- Periodically review and adjust environmental management plans and activities
- Verify the accuracy of past predictions of impacts and the effectiveness of mitigation measures, in order to transfer this experience to future activities of the same type

Monitoring can be particularly important when the decision to proceed with a proposal is controversial. The stakeholders may be concerned about the potential impact of a project on an important resource even if the EA indicates that no significant impacts are likely. In such situations a monitoring program can be important in reducing fears and hostility towards the project.

Monitoring needs to be done at the level required without wasting money by unnecessarily monitoring impacts. Monitoring programmes therefore should be focused on impacts that are either significant. The collection of information needs to be optimised so that enough is collected to be useful, but not so much that it is wasted.

Monitoring might seem expensive but with good monitoring programmes the cost is generally offset against the benefits which monitoring can bring. There are always immediate cost savings in identifying and rectifying unacceptable environmental impacts at an early stage in the project. Longer-term gains include improving the credibility of the proponent when proposing future projects.

¹⁰ Adapted from Pak EPA 1997a; Canter (1996); World Bank (August 1995); and World Bank (June 1996)

5.1.2 Mandatory or Voluntary

Post EA monitoring and reporting is mandatory under clause 19 of the IEE and EIA Review Regulations, 2000.

The Regulations require proponents of all projects (that require an EA) to submit monitoring reports on completion of construction, yearly reports during operation, and any additional reports required by the EPA. The timelines for reporting are however, not feasible for all upstream projects and revised reporting requirements are specified in Section 6.7.2 of the Chapter. Specific details of monitoring and any additional reporting may vary and should be defined in the EA for the particular project.

5.1.3 Types of monitoring

In the upstream oil and gas industry, the following types of monitoring are applicable and followed:

- Compliance monitoring: which involves policing the level of compliance with the requirements of the EA and the environmental approval
- Effects monitoring: which serves to monitor effectiveness of mitigation measures, validate impact prediction, and identify un-anticipated impacts during project execution.
- Pre-project monitoring: applicable where the EA did not cover in detail the baseline environmental conditions or where changes in environmental conditions could have occurred since EA submission.
- Post-project monitoring: which is used to assess residual impacts of the project and ascertain that all requirements related to restoration and decommissioning have been fulfilled.

A summary of the applicability, timing and frequency of the types of environmental monitoring for upstream projects is provided in **Annexure D (Exhibit D-1)**. A process flow diagram of the environmental monitoring process is shown in **Exhibit 5-1**.

5.1.4 Monitoring Programmes

Key features of any environmental monitoring programme are its clear objectives, temporal and spatial controls, practical methodologies, clear responsibilities and open and regular reporting (Glasson *et.al.* 1999). Monitoring programmes should clearly show the linkages between specific impacts identified in the EA and indicators to be measured (WB June 1996). Guidelines on temporal and spatial coverage, methodologies, roles and responsibilities and reporting are further elaborated later in the chapter. A template for effects monitoring programme is shown in **Annexure D (Exhibit D-2)**. For compliance monitoring the mitigation management plan shown in **Exhibit 4-1** would serve the same purpose.

5.1.5 Institutional Roles and Responsibilities

Monitoring is the responsibility of the proponent including the management of information gained from monitoring and implementation of any action that might be required. Proponents might commission consultants to undertake monitoring where they lack manpower and technical expertise. The consultants should have the required expertise, experience and reputation to effectively monitor projects and report their findings. The specific responsibilities of monitoring consultants should be defined in the project EA. The proponent will be accountable and responsible for the completeness and correctness of monitoring data supplied to the regulators or other stakeholders.

The concerned EPA may, at their discretion, set up an Environmental Monitoring Committee for any approved project to check, assist and guide the proponent in the management of the monitoring program. Such action shall be taken where the EPA considers that the scale of likely impacts, or the level of public concern, warrant such action. The Monitoring Committee shall consist of representatives of the EPA (who will chair the committee), the Proponent (and his Consultants as required), key Government Agencies, and representatives of NGO's and the local community. Draft Terms of Reference for such an Environmental Monitoring Committee would typically include the following points¹¹:

- The committee shall meet periodically to advise the proponent whether the monitoring actions being undertaken meet the requirements of the Environmental Approval and as further detailed in the Environmental Management Plan;
- The committee shall advise on any further public consultation which it thinks is desirable;
- The committee shall consider any significant environmental impacts not foreseen in the Environmental Report, and shall advise the proponent of suitable mitigating measures;
- The committee would advise the Chair of any matters, which they believe, should be drawn to his attention.

5.1.6 Ensuring Transparency

In order to ensure and verify completeness and correctness of monitoring data supplied by proponents it will be necessary for the regulators to crosscheck monitoring results and data by supporting documents, random site visits and audits. Similarly proponents must crosscheck monitoring information supplied by the consultants and the contractors for its completeness and correctness.

¹¹ The Pakistan Environmental Assessment Procedures, 1997

5.2 Guidelines for Compliance Monitoring

Compliance monitoring can be done by the use of checklists or by simple observations of the daily activities to record non-compliances to the EMP. It can involve recording the type of non-compliance observed (oil stain, littering etc), its significance (high, medium or low), and its date and location in a non-compliance register. The EMP for the project should define the criteria for significance ranking of non-compliances.

For each non-compliance observed a corrective or preventative action is suggested, responsibility and target date for action is defined (which may lie with the proponent or the contractor), and followed up.

The responsibility for implementation of the corrective or preventative action lies with the proponent and/or the contractor depending on the responsibility assigned. All medium to high significance non-compliances require immediate action and attention of the highest level of management by the proponent and the contractor. For recurring low significance non-compliances the significance ranking can be raised to medium or high to catch attention of the management.

Daily observations of non-compliances can be discussed amongst the proponent, contractor and any third party monitors in a meeting after the end of the day operations. Results of compliance monitoring can be reported in the form of graphs, trend lines, or key performance indicators for management's summary and actions.

As per clause 19 of the IEE and EIA Review Regulations, 2000 monitoring is mandatory for all projects. However, the level of compliance monitoring required would depend on the type of project; significance of impacts; sensitivity of the area; confidence on contractor's in applying the mitigation measures; and any requirements from EPA's. Projects that have a large spatial spread or involve high impact activities would need extensive compliance monitoring (WB June 1996).

Sample non-compliance register and checklists are provided in **Annexure D (Exhibit D-3 and Exhibit D-4)**.

5.3 Guidelines for Effects Monitoring

Effects monitoring can be done to fulfil the following purposes:

- Determine the actual level of impact from a project activity when there is an uncertainty in impact prediction (due to lack of available baseline data or techniques to predict impact) or there are fears that the EA prediction might be biased or technically incorrect.
- Identify unanticipated impacts, which might be neglected in the EA due to lack of time or resources.

Effects monitoring may involve adoption of monitoring methodologies, sampling and testing but the importance of simple observations should not be neglected. The monitoring objectives should clearly show the linkages between specific impacts identified in the EA and parameters to be measured (WB June 1996). Monitoring techniques may not always enable predictions to be verified, because inter alia, time periods and locations do not match, there are too few samples etc. and hence there might be a need for monitoring only “triggers” which can identify the need for detailed data collection.

Guidelines on monitoring impacts on key receptors including wildlife, water and communities are given below.

5.3.1 Wildlife

Upstream projects generate acoustic and sensory disturbance in addition to uptake of wildlife habitat, for which effects on wildlife distribution, abundance, survival, and breeding will need to be assessed and monitored. These impacts vary depending on the type and duration of activity, sensitivity of the project area, the species present in the area, timing of the project etc.

Sources of disturbance from upstream exploration projects are generally localised and short term in nature and hence impacts of individual projects on wildlife species that are abundant; have a wide home range or available habitat; are nocturnal in nature; are not breeding during the project duration are usually temporary and of low consequence. Professional judgement supported by past monitoring exercises have shown that the impacts of upstream exploration projects on small mammals, reptiles, and birds are negligible provided necessary mitigation measures are adopted such as maintaining distances from live bird nests and rodent holes; minimising land uptake and cutting of vegetation; fencing wastewater and water pits etc. Impacts on ungulates and carnivores have also been monitored to be temporary and reversible in nature with the adoption of mitigation measures¹².

The need for wildlife monitoring in non-protected areas may be minimal except if the project area supports a threatened or vulnerable wildlife species or an important habitat, which might be affected by the project. Even within protected areas the nature and scope of wildlife monitoring would depend on the sensitivity of the particular area in which the project is proposed. In parts of a protected area that have a low sensitivity, wildlife-monitoring maybe restricted to general wildlife observations, which could trigger the need for possible detailed studies. However, in core areas wildlife monitoring maybe extensive and targeted to objective data collection.

¹² Based on review of previous monitoring reports for upstream projects

It is also difficult to measure changes in wildlife viability and behaviour by means of monitoring spread over few months and over a few sample sites (Petraitis 2001). Comparison between pre-project and project conditions also requires extensive pre-project baseline information which is not available in most areas. Hence unnecessary cost and resources should not be wasted in collecting data during short-term “one off” projects in low sensitivity areas, which in the end cannot verify impact predictions or cannot identify unanticipated impacts. However, proponents who have an established long-term presence in a concession in protected areas should follow a holistic long-term monitoring programme targeted towards specific species and spread spatially and temporally to provide sufficient data to draw scientific conclusions on anticipated impacts.

a. Water

Upstream projects require water for domestic and operational use. This water requirement can affect sustainable use of the water source and the availability of water for other local users. Past monitoring has shown that impacts on local water resources are of low significance if water abstraction is done within certain controls such as abstracting only 50% of the excess water from existing wells and installing new wells at least 300m from existing wells. However, where the EA identifies the likelihood of any possible impact or where there are public perceptions of water scarcity, monitoring may include monitoring water discharges/levels of water wells in the surrounding of the water well being used to monitor any changes in water levels or water availability and by measuring total dissolved solids in water samples from the well being used and from surrounding wells to monitor any changes in water quality due to over abstraction.

Monitoring effects of water abstraction from a surface water resource is difficult as there maybe numerous downstream users and uses involved and hence water abstraction from surface water resources should be subject to objective and extensive impact assessment. A common indicator for any downstream effects is complaints from downstream users but complaints can be mere “opinions” or can be biased towards the interest of a group of people and would need objective investigations.

b. Communities

Upstream projects can induce economic, cultural and social changes (both in a positive and negative manner). Various techniques can be used for monitoring these changes including surveys, focus group discussions etc.

5.3.2 Guidelines for Pre-project Monitoring

Pre-project monitoring is essentially collection of additional baseline data on selected receptors prior to the start of the project and hence the guidelines and principles for pre-project monitoring are the same as those applicable to baseline data collection. As discussed earlier pre-project monitoring maybe required where there is a likelihood that

changes in environmental conditions could have occurred since EA submission which were not forecasted in the EA or where the EA did not cover in detail the baseline environmental conditions.

5.4 Guidelines for Post-project Monitoring

Post-project monitoring would essentially involve an audit of the restoration and decommissioning activities and effects monitoring surveys (if required) to assess residual impacts of the project on selected receptors (such as wildlife). For certain projects the audit can be done right after the project (like seismic, dry wells etc) and for other projects the audit might have to wait until restoration is done (like processing plants, producing wells).

The timing of the post-project effects monitoring surveys will depend on the objectives of the survey and the receptors on which residual impacts are being evaluated. For wildlife, it is recommended that post-project surveys should be done after a buffer period in which wildlife has the opportunity to adjust and adapt to the changed post-project conditions. Post-project effects monitoring surveys should use the same methodologies as used by the survey done before start of the project and during the project.

5.5 Monitoring as Feedback Tool

Monitoring is used as a learning tool whereby the results of one monitoring feed into the next EIA, improving the impact prediction and helping to focus on key environmental issues (Sadler 1988; as cited in Glasson et. al. 1999). Each following EIA should include the results of the previous monitoring in impact prediction and design of the environmental monitoring programme. Impacts that have been shown to be insignificant in previous monitoring should not be repeated in following EA's.

5.6 Environmental Auditing

Environmental auditing is a 'one off' examination of a project's environmental performance against the requirements of the EA, environmental approval or any other standard. The audit can complement monitoring (by verifying conformance to monitoring programmes, transparency in monitoring and reporting etc) but cannot completely replace those aspects of monitoring that require continued or regular measurements and observations.

Audits can be internal or external. Proponent's can undertake internal environmental audits to check environmental compliance of contractors or completeness and correctness of monitoring data supplied by a monitoring consultant. Regulators can do external audits to randomly check performance of the various projects that they have approved. A sample matrix in which audit observations can be reported is shown in

Annexure D (Exhibit D-5). Based on the findings of the audit the EPA can rate the performance of the proponent's as Highly Satisfactory, Satisfactory, Unsatisfactory or Highly Unsatisfactory using the criteria given in **Annexure D (Exhibit D-6)** {adapted from WB June 1996}.

The audits can be done at any point in time during the project life cycle including the initial stages of the project to identify any gaps that can be addressed as early as possible, the mid of the project and at the end of the project.

Findings of the audit need to feedback into the existing or future EA's, EMP's and monitoring plans. In this way strengths will be highlighted, weaknesses acknowledged and remedied, and gaps in information for effective reporting defined.

5.7 Environmental Reporting

Environmental reporting can serve to inform project management and stakeholders on the environmental performance of a project. Companies across all industry sectors, including the international oil and gas industry, are facing increasing pressure to disclose information regarding their environmental and social performance to governments and the public. Some key reasons why companies are moving into environmental reporting are to (OGEL 2004):

- Satisfy community and individual "right to know" requirements.
- Improve company performance in social and environmental areas by measuring and publicly reporting on these areas
- Demonstrate corporate accountability for the social and environmental impact of operations
- Add shareholder value through the demonstration of a superior ability to manage environmental and social impacts

5.7.1 *Mandatory or Voluntary*

Post EA reporting is mandatory under clause 19 of the IEE and EIA Review Regulations, 2000. The Regulations require proponents of all projects to submit monitoring reports on completion of construction, yearly reports during operation, and any additional reports required by the EPA. The timelines for reporting are however, not feasible for all upstream projects and revised reporting requirements are listed in the following section.

5.7.2 *Frequency*

The frequency of mandatory reporting to EPA for upstream projects will be as follows:

- Seismic, drilling, and pipeline laying projects

- ▶ An end-of-project report (including partial or complete restoration) will be submitted to EPA for all projects outside protected areas
- ▶ Monthly reports will be submitted in addition to the end-of-project report for all projects in environmentally sensitive areas
- Production facilities including processing plants, production wells, pipelines
 - ▶ For processing plants an end-of-construction report will be submitted irrespective of whether the plant is outside or inside environmentally sensitive area
 - ▶ Yearly reports for all facilities outside environmentally sensitive areas
 - ▶ Quarterly reports for all facilities in environmentally sensitive areas
 - ▶ End-of-project report for facility that is decommissioned and restored

In addition to the aforementioned reports the following additional reports maybe submitted in specific situations:

- For projects in environmentally protected areas, a final monitoring report maybe submitted to the EPA detailing the findings of the monitoring activities
- For projects in environmentally protected areas, interim effects monitoring reports may be submitted detailing the findings of effects monitoring surveys

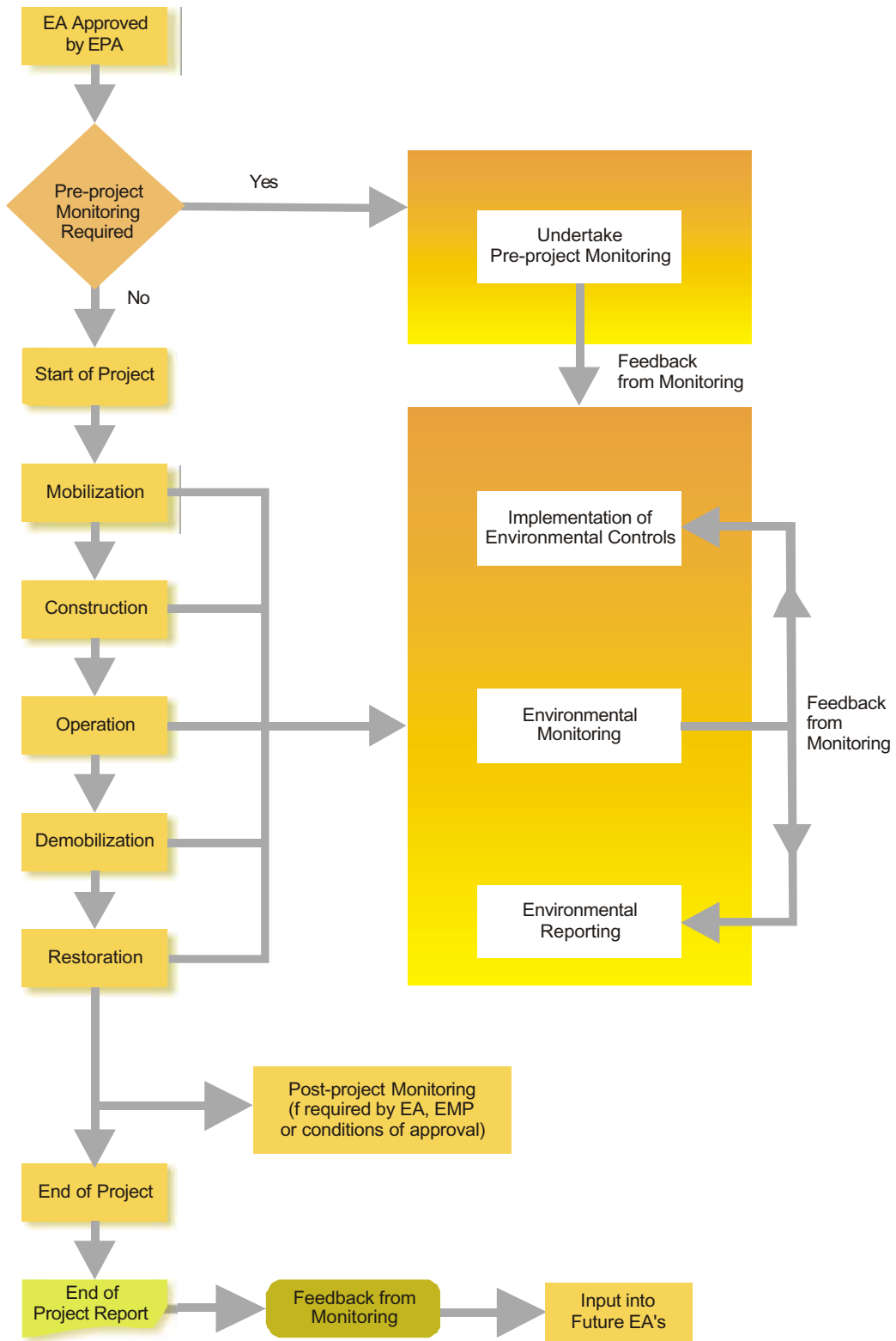
Other voluntary and internal forms of reporting including daily and weekly report to the proponent's management.

The suggested contents for environmental reports are provided in Annexure D (**Exhibit D-7**). However, the proponent may revise the contents and decide formats based on the nature of its operations and baseline conditions and agree these with the concerned EPA.

5.7.3 *Review and Feedback*

The EPA or the Monitoring Committee shall review all reports submitted to EPA and can provide feedback to the proponent in written. The feedback shall be incorporated by the proponent in its ongoing or future projects and any disagreement on the feedback can be contested with the DG EPA.

Exhibit 5-1: Process Flow Diagram for Environmental Monitoring



Part III: Guidelines for Protected Areas



6 Guidelines for Protected Areas

6.1 Protected Areas

Protected areas¹³ in Pakistan include protected ecosystems and archaeological and cultural sites. In the Guidelines for Environmentally Sensitive and Critical Areas, 1997 protected ecosystems are defined to include wildlife sanctuaries, national parks, and game reserves with a vague reference also made to protected and reserve forests (Pak EPA 1997b). No specific mention has been made of sites/areas that receive protection under obligation to the international conventions such as Ramsar sites, World Heritage sites and that have not yet been notified as protected areas under local laws.

For the purpose of these guidelines protected areas will include the following:

- Protected archaeological and cultural sites listed in the official gazette
- Wildlife sanctuaries, national parks and game reserve listed in the official gazette
- Community managed conservation areas, which have legal cover under the provincial wildlife laws
- Sites/areas (such as Ramsar sites and World Heritage sites) that receive protection under obligation to the international conventions to which Pakistan is a signatory or a party
- Protected and reserve forests listed in the official gazette other than notified under the wildlife laws.

6.2 Objectives of the Guidelines

The guidelines are prepared with the following objectives:

- To list down the type of protected areas in Pakistan
- To provide details of the protected areas in Pakistan
- To explain legal restrictions related to oil and gas exploration and production in protected areas
- To define setbacks from protected areas and also activities that are environmentally benign and can be allowed in protected areas without the need for an EIA

¹³ While the 2000 Regulations and the Guidelines for Environmentally Sensitive and Critical Areas, 1997 (part of PEAP 1997) use the word “environmentally sensitive areas” to refer to protected areas in Pakistan, the present guidelines prefer to use the word “environmentally protected areas” in place of environmentally sensitive areas since the latter is a much broader term, the use of which can create ambiguity in the scope and applicability of the guidelines.

- To outline procedures for operating in protected areas
- To advise use of best practices and environmental enhancement schemes for oil and gas projects in protected areas.

The guidelines recognise that numerous other technical guidelines exist on the related topic and hence make no attempt to replicate these. References to some useful existing guidelines have been made in the text so that they can be referred to for more details.

6.3 Details of Protected Areas in Pakistan

6.3.1 Ecosystems

Approximately 11.3% of the total area of Pakistan is declared protected under provincial wildlife laws. The protected areas comprise 17 national parks, 99 wildlife sanctuaries, 89 game reserves and 17 unclassified areas^{14,15}. **Exhibit E-1, E-2, and E-3 in Annexure E** provide an overall summary of the protected ecosystems in Pakistan, definitions of ecological protected areas; and a summary of the Ramsar sites in Pakistan. Map of protected ecosystems is provided in **Exhibit 6-1**.

An up to date list of protected areas in Pakistan can be obtained from the National Council for Conservation of Wildlife (NCCW) or from the office of the Inspector General of Forests (IGF). A summary of the laws and institutions relevant to protected ecosystems in Pakistan is provided in Part II of the Guidelines.

6.3.2 Archaeological Sites and Monuments

In Pakistan there are about 389 sites notified by the federal government and 444 sites notified by Punjab and Sindh government. Out of the 211 sites in Sindh, Karachi alone has over 200 buildings declared as “Protected Heritage” by the Government of Sindh. A summary of protected archaeological sites, monuments, buildings and cultural heritage sites in Pakistan is attached in **Annexure E, Exhibit E-4** (Pak EPA 1997b). There are also a few archaeological sites of international importance notified by the World Heritage Convention (see **Annexure E, Exhibit E-5**).

There are no officially notified or protected geological sites in Pakistan. However if there is any significant fossil finds during the course of development of a site the Federal Director General for the Museum of Natural History should be consulted (Pak EPA 1997b).

¹⁴ Information obtained from NCCW

¹⁵ Unclassified Protected Areas include community managed conservation areas, private game reserves and areas of global significance like Ramsar sites which are not covered under protected areas system

6.4 Sensitivity of Protected Areas and the Ecosystem Approach

Protected areas characterised by sensitive ecosystems that are particularly vulnerable to both natural and man induced changes. These areas render various services and functions that have cultural and biodiversity important (see **Annexure E: Exhibit E-6**). While oil and gas exploration and production offer potential for much needed economic and social development, the diverse range of activities involved can have environmental and social consequences. If not managed well, such effects may persist well after the exploration and production activities have ceased. One approach to seeing development in protected areas is to apply an ecosystem approach, which evaluates how human uses of an ecosystem can affect its functioning and productivity and tries to optimise benefits by making tradeoffs efficient, transparent and sustainable. In recognising the ecosystem approach, oil and gas exploration and production companies should as a fair exchange for the resources extracted ensure that the ecosystem continues to function, the local environment is not damaged and the local communities enjoy long term benefits (IUCN March 2003).

6.5 Legal Restrictions on Upstream Projects in Protected Areas

According to the present laws, upstream projects cannot be undertaken in national parks or wildlife sanctuaries in federal territory, NWFP, Balochistan and Punjab, AJK and Northern Areas. In Sindh, there is a provision under an amendment to the SWPO 1972 (see summary of environmental laws provided in Part II of the guidelines) by which exploration and production is allowed in wildlife sanctuaries and national parks, provided an EIA concludes that significant impacts of exploration and production will not occur and the same is approved by the concerned EPA after consultation with the relevant stakeholders.

By virtue of the restrictions that are imposed, upstream projects are not allowed in reserve forests (state forests in case of Balochistan) throughout Pakistan but can proceed in protected forests after approval of an EIA and with the permission of concerned forest department.

There are no restrictions on oil and gas exploration and production activities near archaeological and cultural sites, provided an EIA is undertaken and approved by the EPA.

6.6 Minimum Distances from Protected Ecosystems

Areas contingent to the protected ecosystems may bear sensitivity that is similar to that of the protected ecosystem itself. These areas are “buffer areas” in which restrictions on oil and gas exploration and production that are similar (but not the same) to those applicable in the protected area maybe necessary to avoid spill over of significant impacts. In protected ecosystems where there is prohibition on oil and gas exploration a

setback of at least 300m will be maintained from the boundary of the protected ecosystem. Similarly, any exploration and production activity, which is at least 300m from the boundary of a protected ecosystem, will not require an EIA.

The 300m setback is based on the average zone of acoustic disturbance that is expected from most exploration and production projects. However, this distance may vary with the type and level of activity, sensitivity of the area, and probability of impacts and the EPA can increase or decrease this distance at it deems necessary. Proponents of projects that lie close to protected areas will establish the need for increased setbacks in consultation with the concerned EPA in the planning phases of the projects.

6.7 Activities Permissible in Protected Areas

The EPA and the conservation authorities, in buffer areas and even in protected areas can allow some activities associated with oil and gas exploration and production projects that are environmentally benign without the need for an EIA. Such activities may include gravity surveys in buffer areas; laying seismic cables across a protected area (such as a small wetland); using an existing public road that passes through a protected area etc. The proponent will discuss any such activity with the concerned EPA and the conservation authority in the planning phase of the project and seek their approval in this regard through an IEE.

6.8 Procedures for Operating in Protected Areas

6.8.1 Pre Concession Award Planning

Oil and gas regulatory institutions (such as DGPC) and exploration and production companies should be aware of the presence of protected areas prior to award and acquisition of new concessions so that the commitments (such as EIA) and legal restrictions are known at an early stage. The conservation NGO's and provincial and federal conservation authorities¹⁶ can assist DGPC and oil and gas exploration and production companies in setting up a GIS database of protected areas in Pakistan. Protected ecosystems in which there are legal prohibitions on oil and gas production activities should be highlighted on a GIS map over which oil and gas concessions and prospective oil and gas bearing structures within the concessions can be overlaid.

For protected areas in which upstream activities are allowed, companies should be able to negotiate realistic commitments with the DGPC (in terms of project deadline) on the basis of time frames required for gaining a decision on EIA(s).

Protected areas, in which upstream activities are not allowed (at the time of award of the concession) will not be accessible to the companies for exploration and production

¹⁶ conservation authorities include wildlife departments, forest departments and departments entrusted with the protection of archaeological and cultural sites

activities unless consensus of civil society and permission of conservation authorities is obtained. This might require a re-evaluation of the status of the protected area by conservation NGO's and regulatory bodies to see if oil and gas exploration and production can be allowed in the protected ecosystem. Other options that can be evaluated include zoning to allow activities only in less sensitive parts of the protected area; compensation and rehabilitation planning for compensating unavoidable impacts; management planning for long term sustainable use of the protected ecosystem through partnership amongst the local communities, NGO's, regulators and the exploration and production company. The companies should be aware of the timelines involved and investment required for gaining access to and working in protected areas and should make appropriate provisions for these in the planning stages of the exploration and production programme.

6.8.2 Baseline Studies

Where oil and gas exploration is expected to cover a significant portion of a protected ecosystem detailed baseline studies may be required to determine the overall resources of the protected area if not undertaken already. These baseline studies will support the EIA and furnish details to make assessment of the amount of resources that will be affected by oil and gas exploration and its impact on the viability and sustainable use of the resources. These baseline studies will need to cover the entire environment in their scope including the physical, biological, and socio-economic environment.

Primary data may be gathered through direct methods (e.g. transect sampling) or indirect methods (e.g. anecdotal information from hunters or fishermen on species hunted/caught). A large number of useful reference works exist on the range of assessment methods available for the collection of primary data on biodiversity and have been cited in WB (March 2000). It is vital to select robust methodologies for data collection to provide a sound basis for impact prediction. This includes providing for longer-term fieldwork to incorporate natural variability and seasonality elements. The fieldwork should also be designed in such a way as to provide a basis for long-term monitoring, and every opportunity should be taken to build local capacity in data collection to provide the human resources for future monitoring. Particular care should also be taken to identify and map spatial variation. Full use should be made of maps, and, where expertise is available, of remote sensing and GIS (see WB Updates nos. 3 and 9¹⁷). For many species, it is not realistic or indeed necessary to obtain absolute figures for abundance. Figures on relative abundance (e.g. relative density of the species in the project area compared with other known locations) may be equally useful for the purposes of ecological impact assessment (WB March 2000).

¹⁷ WB April 1993 and WB January 1995

EIA's are a requirement for all upstream projects in protected areas. The EIA's can be used as a decision making tool to allow or disallow upstream projects in protected areas. Upstream projects are allowed in game reserves and in the surroundings of protected archaeological and cultural sites subject to the approval of an EIA. In Sindh, after the amendment in SWPO issued in June 2000, national parks and wildlife sanctuaries are also included in this category. No such provision has been made in the governing laws in the federal territory, Punjab, NWFP, Balochistan, Northern Areas and AJK. Hence for projects outside of Sindh, a modus of operandi will need to be discussed with the conservation NGO's and conservation authorities for upstream projects in a wildlife sanctuary or a national park before an EIA is commissioned and decided upon.

The WB (March 2000) lists the following factors to be considered in EIA's for projects in sensitive ecosystems:

- Present the magnitude or physical extent of predicted impacts in quantifiable terms, e.g. area of land taken, percentage of habitat lost or number of communities, species or individuals affected. Place these in international, regional, national or local context where appropriate.
- Consider impacts, direct, indirect, induced, cumulative impacts and interactions between environmental, social and economic impacts. Indirect impacts may often be more significant than direct, and cumulative impacts are often of particular importance for biodiversity.
- Assess the significance of impacts on biodiversity, for all project components and options, on the basis of: biophysical context and sensitivity of receptors (e.g. describe elements of wildlife and earth science interest affected, their importance, sensitivity, ability to escape or relocate); socio-economic and cultural context (e.g. number and characteristics of people likely to be affected and their locations, social systems that may be disrupted); characteristics of the impacts such as probability of occurrence (very likely, or unlikely); duration (time period over which they will occur); area affected (size, and whether near or far from project); reversibility (natural recovery, or aided by human intervention); applicable environmental laws and regulations; and trans-boundary aspects.
- Consider short- or medium-term as well as long-term or permanent impacts. Consider positive effects, which might enhance biodiversity, as well as negative effects.
- Establish cause and effect, and specify uncertainties in prediction resulting from gaps in data or knowledge.

- Assess the significance of impacts likely to arise from the project against the projected baseline rather than against existing conditions revealed in the field surveys.
- State the predicted post-mitigation significance of impacts, i.e. the significance of residual impacts after all proposed mitigation measures have been taken into account.

The key issues in impact prediction and assessment are assessing the magnitude of impacts – either absolutely or by using a defined scale - and then evaluating the significance of predicted impacts. It is essential that the criteria by which magnitude and significance are judged be clearly set out in the EIA report. Some definitions of impact magnitude and significance as cited in WB (March 2000) are given in **Annexure E (Exhibit E-7 and Exhibit E-8)**.

The EIA's should be based on full and effective public participation (from conservation NGO's; local communities; and others) at all stages of the EIA including scoping, preparation and decision. The regulators and other stakeholders should in the scoping phase of the EIA determine the scope and type of the EIA (whether a programme level EIA is required to assess long term cumulative effects of exploration and production) and impacts assessment methodologies and techniques. In the EIA preparation phase companies in consultation with stakeholders can develop specific codes of environmental practices covering key areas such as disposal of drilling wastes.

Guidelines on the preparation, submission, review, approval and follow up of EIA's, and public consultation are provided in Part III and Part IV of the Guidelines. Detailed guidelines on biodiversity impact assessment and culture and heritage impacts assessments are provided in WB (March 2000) and WB (September 1994) respectively.

6.8.4 Project Implementation

If an EIA is approved, proponents will need to ensure that they fully implement the commitments made in the EIA and the conditions of approval. Monitoring of both short and long term projects should be done with clear objectives and goals and the results of monitoring should be disseminated to the regulators; NGO's; local communities; and other interested parties. Monitoring programme should be discussed with stakeholders prior to implementation and the need for long term monitoring for objective verification of effects on key sensitive receptors should be considered. The regulators and NGO's in consultation with the exploration and production companies should define key performance indicators (KPI) and audit individual companies against the KPI's and other audit standards (such as EIA, EMP, conditions of approval) to judge the performance of the individual companies and the effects of the projects on the ecosystem. Proponents may follow a widely effective disclosure and public awareness programme to increase credibility and reputation.

6.8.5 Enhancement Projects

Proponents working in protected areas will be expected to produce a net positive benefit from their presence in the area and compensating for any residual and significant impacts that arise from their operations. Significant exploration and production activities in protected areas would mean a revised management plan for the area that can be supported or funded by the proponent and that takes into consideration the co-existence of wildlife, communities and oil and gas exploration and production.

6.8.6 Project Closure and Restoration

Proponents will need to follow strict closure and restoration requirements to ensure that the areas that they have used are restored to as close to their original condition as possible and that they can be returned to the pre-project use.

6.9 Credibility of Proponents

The credibility of proponents plays an important role in gaining access to protected areas. The EPA's, conservation authorities and other stakeholders take into consideration the proponent's track record, environmental management systems, top management commitment and openness and fairness in communication in granting their permission or consensus on projects in protected areas. A credible and environmentally conscious proponent will therefore not only be protecting the environment but will also have competitive advantage over other companies.

6.10 Application of Best Practices

Activities within the protected areas will require adoption of best practices and environmental controls beyond the typical mitigation measures that have been discussed in Part I of the guidelines. Companies should ensure that the EIA's and their own management systems identify, adopt and share best practices followed internationally. Useful material can be found from international associations (such as OGP); international publications (such as those in the Society of Petroleum Engineers and others); guidelines by donor agencies and conservation NGO's; and standards prescribed by other countries with similar environmental and economic conditions.

6.11 Promoting Net Positive Benefit

The goal of effective treatment of biodiversity in oil and gas projects should be to enhance positive impacts on biodiversity and not only to mitigate or compensate adverse impacts on biodiversity. World Bank favors preventive measures over mitigation or compensatory measures, whenever feasible but there is a need to go beyond this preventive role of EA to enhancing positive impacts (WB March 2000).

The growing presence of oil and gas exploration and production in protected areas around the world represents both risks and opportunities for conservation of the protected areas. The approach should not only be to minimise adverse effects but also to maximise benefits by partnering with conservation NGO's and local communities to alleviate existing threats to the protected area and improving its management and conservation. Numerous examples of such approach exist in country and around the world. Case studies of oil industries operating in sensitive areas around the world can be found in SPE (1998).

LEGEND

- INTERNATIONAL BOUNDARY
- PROVINCIAL BOUNDARY
- INDUS RIVER
- RAMSAR SITES
- GAME RESERVE
- WILDLIFE SANCTUARY
- NATIONAL PARK



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Client



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 www.halcrow.com



Project
**SECTORAL GUIDELINES FOR
 UPSTREAM PETROLEUM
 SECTOR - ONSHORE**

Drawing

**PROTECTED ECOSYSTEMS
 OF PAKISTAN**

| Drawn by | Checked by | Approved by | Date |
|----------|------------|-------------|------------|
| AQ | | | 30.09.2004 |
| TJ | | | 30.09.2004 |
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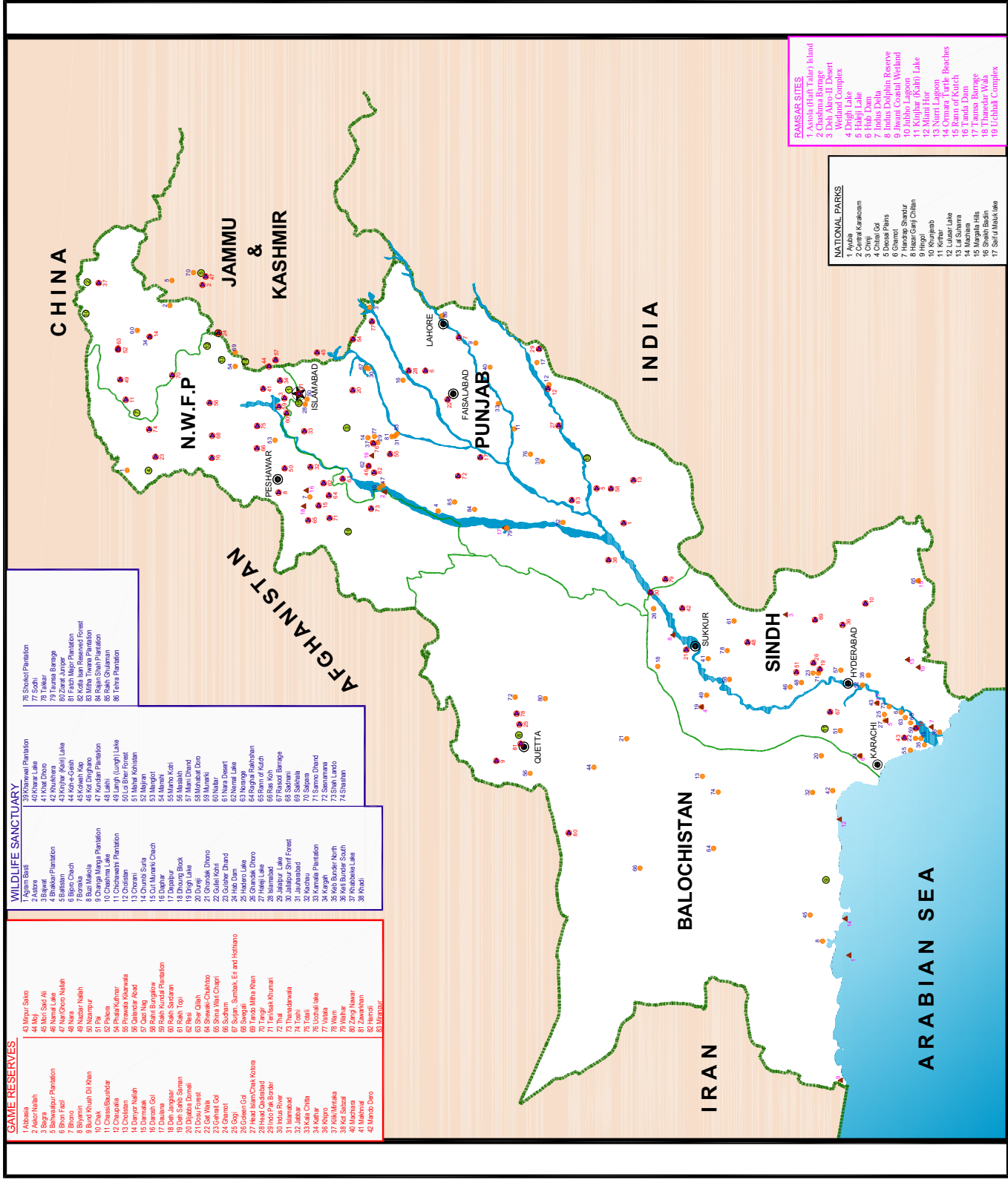
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EXHIBIT 6-1

Drawing Scale: SEE ABOVE

CAD Filename: PROTECTED_ECOSYSTEMS.dwg

Plot Scale:



- RAMSAR SITES**
1. Assala (Dah Talai) Island
 2. Chashma Barrage
 3. Doh Alro-U Desert
 4. Dugli Lake
 5. Haki Lake
 6. Hub Dam
 7. Indus Delta
 8. Indus Plains
 9. Indus Coastal Wetland
 10. Jubba Lagoon
 11. Kunlur (Kali) Lake
 12. Miani Hor
 13. Nuari Lagoon
 14. Rann of Kutch
 15. Ramsar Beaches
 16. Tando Dam
 17. Tansa Barrage
 18. Thanesar Wala
 19. Uchhal Complex

- NATIONAL PARKS**
1. Aasko Karakoram
 2. Central Karakoram
 3. Chitral
 4. Chitral Gorge
 5. Garamashe
 6. Garamot
 7. Hazrat Shahdar
 8. Hazrat Gani Chihil
 9. Hunza
 10. Kumbhar
 11. Kirthar
 12. Lulusar Lake
 13. Mazar-e-Sharif
 14. Machiana
 15. Margalla Hills
 16. Shaikh Badin
 17. Shir Ali Mulla Lake

- WILDLIFE SANCTUARY**
1. Agam Basti
 2. Adere
 3. Ahar
 4. Bhakkar Plantation
 5. Baitalan
 6. Bappa Chah
 7. Bappa Chah
 8. Bari Mela
 9. Charga Margi Plantation
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Part IV: Guidelines for Public Consultation



7 Guidelines for Public Consultation

7.1 Introduction

There is a growing consensus that timely and broad-based stakeholder involvement is a vital ingredient for effective environmental assessment, as it is for project planning, appraisal and development in general. The World Bank has found that public participation in EIA tends to improve project design, environmental soundness and social acceptability (WB May 1999). Conversely, EIAs that fail to be inclusive tend to have less influence over planning and implementation, and consequently result in higher social and environmental costs.

Placing sufficient emphasis on stakeholder involvement in the EIA process can also improve the predictive quality of environmental assessments. This is because the prediction of impacts using EIA often requires multi-year information and good quality baseline data. Yet one of the most common problems with “conventional” environmental assessment is that time and financial limitations, and project cycle schedules, constrain the collection of such data. Hence predictions are often based on a “snapshot” picture, which can be misleading or inaccurate. In contrast, assessments that involve different stakeholder groups, including those in local communities, have greater potential to access a wider information resource-base, and in some cases, generations of cumulative knowledge of their local environment (IIED, September 1998).

7.2 Legal Requirement for Public Consultation

Public consultation is mandatory under the 2000 Regulations for all EIA's. However, if required, the DG of the relevant EPA can also subject IEE's to the same requirement. Pak EPA (1997c) in its guidelines for Public Consultation further deliberates on the requirement for public consultation. The subject guidelines are intended to augment the afore-mentioned guidelines to make them more specific and applicable to upstream projects and avoid repetition of previous work and literature. More details on the concept of public consultation and its benefits can be read from material referenced in the guidelines.

7.3 Key Concepts in Public Consultation

7.3.1 Community

A community is “a group of individuals living together in some form of social organization with cohesion in planning and operation and/or manifesting some unifying trait or common interest”.

In simple terms, a community is a group of people having ethnic or cultural or religious characteristics in common. Similarly a community can be defined as a society of people having common rights and privileges, or common interests, civil, political, etc. or living under the same laws and regulations.

7.3.2 Stakeholders

Howlett and Nagu (1997) define stakeholders as “all those people and institutions who have an interest in the successful design, implementation and sustainability of the project”. This includes those positively and negatively affected by the project.

7.3.3 Consultation

Consultation is two-way flow of information between the proponent and the public, providing opportunities for the public to express views on the proposal. It is also defined as deliberation, discussion, and dialogue to seek information and advice and to take into consideration opinions, facts, and interests of various stakeholders related to a development (Siddiqui 2004).

7.3.4 Participation

The World Bank defines the concept as: “Participation is a process through which stakeholders influence and share control over development initiatives and the decision and resources which affect them” (WB 1994).

7.3.5 Engagement

Engagement is binding by contract, or commitment; bringing into conflict or confronting; occupying or absorbing; interlocking with another. That is to say that Civic Engagement is a process through which citizens and citizens’ organizations can pursue a relationship, or involvement, with government and other stakeholders to analyze a situation, negotiate, influence the design, and participate in the implementation, monitoring and evaluation of development actions (whether in the shape of projects, programs, or policies)

7.4 Outline Guidelines for Public Consultation

Outline guidelines for public consultation for upstream projects that require EIA’s are listed below. The purpose of the outline guidelines is to provide broad guiding principles on which a consultation programme should be based; these are supported by the detailed procedures for consultation detailed later in the following sections (adapted from EPA Queensland 2003).

1. The consultation process should be planned, open and accountable
 - ▶ Consultation with a range of interest groups should take place as early as possible dependent on the situation and need.

- ▶ The proponent should be prepared for different interest groups to emerge at different times in a project.
 - ▶ The media should be considered as an important interest group who needs to have accurate and timely information about an activity.
 - ▶ Communications planning should be undertaken together with consultation planning.
 - ▶ The decision-making process should be outlined and discussed with interest groups.
 - ▶ The type and amount of consultation required should be discussed with interest groups.
 - ▶ As necessary, approval from the delegated decision-maker should be given at the various stages in the activity or project, before moving on to further consultation.
 - ▶ The use of an independent person, such as a consultant, to conduct the consultation should be considered.
 - ▶ The negotiables and non-negotiables should be outlined in the beginning stages and discussed so there is a clear understanding of what issues are open to consultation. This will help ensure that expectations are realistic.
 - ▶ Open discussion should take place about the reasons for non-negotiables to determine whether they are for administrative convenience only, or are essential to the delivery of the project or activity.
 - ▶ All relevant issues should be identified with interest groups and openly discussed.
 - ▶ The terms of reference for a project should be provided to interest groups with adequate time being given for their input.
 - ▶ Feedback should be given to interest groups on decisions made, and on how, why and to what extent public input has contributed to the decision.
 - ▶ All consultation input should be recorded and made available to interest groups, for example, minutes of meetings, summary of key issues in final reports. Privacy issues for individuals or groups should be respected. Individuals should not be named without their permission.
2. The consultation process should be structured to consider the information needs of interest groups.
- ▶ The time that some groups/individuals need to become informed, reflect on issues, and develop a considered response should be taken into account. Timelines for responses may need to be negotiated with interest groups.
 - ▶ Information about other consultations being conducted at the same time as the activity should be obtained, and where necessary, the timing of activities should be altered.

- ▶ Consultations should be arranged so they are not being conducted over public holidays, and other religious and cultural celebrations, as many individuals and groups will not be able to participate.
 - ▶ Sufficient time should be allowed for people in rural areas to travel to activities.
 - ▶ More time may be required to consult with people or groups with particular cultural perspectives.
 - ▶ Many groups are volunteer organisations with limited resources. Providing stationery and photocopies of relevant information for these groups to participate in workshops may be helpful.
 - ▶ Information on the issue or activity should be easily and freely available so that people can be fully informed about the activity or project. Information on past consultations and/or projects needs to be available so past information can be considered.
 - ▶ People/interest groups may need to be informed and educated about the issues before they can participate and provide their informed input.
 - ▶ The proponent should make themselves aware of different language needs, literacy levels and consider the needs of audiences and develop responses to meet those needs.
 - ▶ The consultation process needs to show respect for the needs, views and concerns of stakeholders. Respect should be shown through listening, acknowledgement of the different viewpoints and adoption of a non-confrontational attitude.
3. The consultation process should be documented and evaluated to ensure its effectiveness.
- ▶ Written consultation plans should be developed for activities or projects requiring consultation and approved by the relevant level of senior management, before the project or activity proceeds.
 - ▶ The consultation plan should be monitored and adapted over the life of the project or activity, in consultation with interest groups, as new needs and issues emerge.
 - ▶ Explicit provision should be made for budget and other resources to be allocated in support of the consultation plan, with these resources adjusted over the life of the activity as needs change, or new needs emerge.
 - ▶ Consultation activities should be assessed regularly during a project and more thoroughly evaluated at the final stage or completion of a project.

7.5 Procedures for Public Consultation

Public consultation is a process and not an activity; like EIA's consultation programmes have a life cycle comprising design and planning of a consultation programme, implementation of the programme, receiving feedback from the programme and

incorporating it into the project and the EIA, and fair and transparent reporting of the consultation outcomes. These key elements of a consultation programme are deliberated upon in detail in the following sections.

7.5.1 Designing a Public Consultation Plan

The first step in public consultation is to design and plan a public consultation programme. A step-wise approach towards designing an effective consultation programme is detailed in the following sections. The consultation plan should be developed as early in the EIA scoping phase and modified and improved, as more data becomes available.

Step 1: Secure commitment to effective consultation

The success of a consultation exercise requires that proponents understand its purpose and are committed to its success. The positive attitude of the proponent will give the process credibility and play a large part in securing the trust and cooperation of the public at large. Moreover the quality and follow-through of the process are enhanced if those who are investing time and money are convinced that resources are being well spent (WB May 1999).

Step 2 Scope consultation plan

Like in EIA's, the first step in a consultation plan is to gain an understanding of the key issues and the areas where most of the efforts need to be directed, including: key issues to be addressed; key organisations to be involved; and time frame for public consultation (WB May 1999).

Step 3 Define stages and goals

Public consultation needs to be done at key stages of a project and the EIA with clear objectives for meaningful outcome. **Annexure F, Exhibit F-1** lists some key objectives and goals of public consultation at different stages of an EIA (WB May 1999). In addition, consultation exercise may target the following goals (adapted from EPA Queensland 2003):

- The provision of factual, accurate information about the project and its likely environmental, social and economic impacts where there is a genuine requirement or request for such information
- The identification and understanding of community values, concerns and interests
- Demonstration that the community's views are being taken into account in the planning and operation of the project focusing on participation

- Encouraging within the community a level of confidence that the exploration and production operations are to be environmentally responsible (and not exclusively driven by economic considerations)
- Evaluation of community acceptance of the project.

Step 4 Identify stakeholder groups

Stakeholders are those who effect change and those who are affected by it. The aim of inclusiveness makes the identification of stakeholders important; excluding an important stakeholder can undermine the process. Identification of stakeholders is not an easy task, especially at the earlier stages of a project. For example, The Republic of Ireland's guidelines provide a list of over one hundred stakeholder groups that should be considered as contributors to the environmental assessment process. These include government agencies, citizen's groups, NGOs, recreational interest groups, expert groups, business affiliations and academic organizations (Irish EPA, 1995).

Also, different types of stakeholders can contribute to the EA process in different ways and, in most cases inputs from a broad variety of stakeholders will complement the EA process, "Stakeholder interests exist at different levels. For example, at the local project level, they might include land or water access rights, pollution or market opportunities. At regional or country levels, stakeholder involvement might focus more on issues concerning renewable versus non-renewable resource use..." (Carson 2001).

For the purpose of oil and gas exploration and production operations typical stakeholders may include government agencies, civil society, proponent, local communities, and influential people like large landowners, tribal leaders, and spiritual leaders (see **Annexure F, Exhibit F-2** for comments on different stakeholder groups).

Step 5: Understand the decision making process

Once the stakeholders have been identified it is important to understand the role of the individual stakeholders in decision making i.e. which parties make which decisions at what stage of the project life cycle (WB May 1999).

Step 6: Review past consultations

One of the most important influences on community attitudes is previous experience. On occasion, people are reluctant to become involved in a second consultation process ("We've already been consulted."). If they have taken part in one form of process, they may be reluctant to try a different one. This is often true even when the previous process was neither successful nor satisfying.

In planning a consultation programme previous consultation history should be reviewed before going too far with a consultation process.

Step 7: Determine the necessary level and techniques of consultation

Public consultation can take place at three different levels: conveying information to the public, listening to the opinions and preferences of the public and involving the public in making decisions. True public involvement or participation require a high level of skills and efforts and are not advocated here as mandatory. However, where proponents are able to go beyond the formal level “consultation” to “participation”, they will achieve even greater benefits for themselves and for the stakeholders (Pak EPA 1997c).

There are various techniques detailed in literature on techniques for public consultation. However, the most applicable techniques are detailed in following sections.

7.5.2 Implementing a Consultation Programme

Phase I – EIA Scoping

The objective of consultation at the scoping phase is to identify and understand key issues and concerns, as they are perceived by the stakeholders, initiate a communication link with key stakeholders and gain their confidence and trust.

The level of consultation required in the scoping phase of an EIA will vary with the type of project, the proponent, the sensitivity of the area, and public concerns associated with the project.

a. Existing upstream exploration and production programmes

For existing upstream exploration and production programmes in protected areas it is assumed that an initial understanding of key issues, public perception, and significant impacts would have been gained through previous EIA's and hence any new EIA will need to build upon that work without having to replicate efforts. At the scoping phase of an EIA, proponents will be required to submit the ToR for the EIA to the concerned EPA, concerned conservation authority, and prominent NGO's for comments and information. 10 days after submission of the ToR a meeting should be held at the office of the concerned EPA attended by the proponent (and its consultant), EPA, conservation authority, and prominent NGO's to discuss and finalise the ToR. It will not be practicable to include communities in the meeting due to problems with logistics and representation from various communities but it is expected that government and non-government departments present during the meeting will wilfully protect the rights and concerns of local communities and ensure that community consultation is a mandatory part of the fieldwork.

b. New upstream exploration and production programmes/projects in protected areas

Where exploration and production programme/projects are proposed by new proponents, or in areas inaccessible previously (or for some time) to exploration and production the range of issues and public concerns will be broad and hence the level of public consultation required will be high. A consultation programme in such cases will have to be discussed with the regulators, NGO's and local communities.

Phase II: Field visits

During field visits consultation will be held with influential people, local communities, and government agencies (including local representatives of EPA's and concerned conservation authority). The consultation techniques to be employed are detailed below:

a. Influential People

Influential people may involve tribal leaders, spiritual leaders or other prominent people who have influence on the local governance, local resources and lives of local communities. It is important to identify and meet influential people in the early stages of a project to identify their concerns and requirements; to discuss and finalise the modus of operandi for consultation with local communities; and to finalise procedures for local procurement, employment and use of natural resources. Consultation with these leaders should be done by responsible and senior people from the proponent's organisations accompanied by the team leader for the EIA. For repeated projects, it might not be necessary to meet influential people for every individual EIA.

b. Government agencies

Government agencies may include local representatives of EPA, concerned conservation authorities, line departments who might have a stake in the project e.g. irrigation department if the project involves abstracting water from canals etc. Consultation with these departments should be done in one-to-one meetings during which the project should be described along with the objectives of the meeting and feedback from the agencies obtained. Clarity should be gained on the roles and authorities of these agencies and any legal requirements with which the project will be required to comply. Local government has a major role in the development of the area under its jurisdiction and also hold useful information about the socio-economic environment of the area and therefore local government representative such as Nazim and Naib-nazim should be included in the consultation process.

c. Local communities

Various techniques are available for consultation with local communities. Some specific tools included in the World Bank Participation Sourcebook and other literature and applicable to upstream projects are described in outline below (WB 1994). **Annexure F, Exhibit F-3** also lists items necessary to ensure effective community involvement in public consultation. The objectives of the consultation should be to inform local

communities about the project, gather feedback and concerns regarding the project, and identify opportunities of social development projects. Care should be taken in addressing “opinions” and “expressions” about performance of previous projects and handling political manoeuvring of the consultation process for personal benefits. It might not be possible to consult “all” people living in the area and hence the consultation programme should be based on a sample size ensuring representation from all communities (specially the poor and underrepresented) that might be affected including women with whom separate meetings and discussions should be held.

- Participant observation: is a fieldwork technique used by anthropologists and sociologists to collect qualitative and quantitative data, which leads to an in-depth understanding of people’s practices, motivations and attitudes. Participant observation entails investigating the project background, studying the general characteristics of a population, and extended residence among beneficiaries during which time interviews, observations, and analyses are recorded and discussed.
- Village meetings: have many uses including information sharing and group consultation, consensus building, prioritising and sequencing of interventions, and collaborative monitoring and evaluation. When multiple tools such as resource mapping and focus groups have been used, village meetings are important venues for launching activities and gaining feedback on analysis.
- Focus group meetings: are relatively low cost, semi-structured, small group (4–12 participants plus a facilitator) consultations used to explore people’s attitudes, feelings or preferences, and for consensus building. Focus group work is a compromise between participant-observation, which is less controlled, lengthier and more in-depth, and pre-set interviews, which are not likely to attend to participant’s own concerns.
- Mapping: a generic term for gathering in pictorial form baseline data on a variety of indicators, is an excellent starting point for participatory work because it gets people involved in creating a visual output which can be used immediately to bridge communication gaps and to generate lively discussion. Maps are useful as verification of secondary source tools, for comparison, and for monitoring of change.
- Needs assessment: is a tool that draws out information about people’s varied needs, raises people’s varied needs, raises participant’s awareness of related issues, and provides a framework for prioritizing needs. This type of tool is an integral part of gender analysis, and to develop an understanding of the particular needs of both men and women, and to do comparative analysis.
- Seasonal diagrams: show the major changes that affect a household, community or region within a year, such as those that are associated with climate, crops, labour

availability and demand, livestock, prices and so on. Such diagrams highlight the times of constraint and opportunity, which can be critical information for planning and implementation.

- Semi-structured interviews: also called conversational interviews, are partially structured by a flexible interview guide, which has a limited number of pre-set questions. This type of interview guide ensures that the interview remains focused on the development issue at hand while allowing the interview to be conversational enough so that the participants can introduce and discuss topics, which are relevant to them. These tools are a deliberate departure from survey-type interviews with lengthy, pre-determined questionnaires.
- Socio-cultural profiles: describe in detail the social and cultural dimensions, which (in combination with technical, economic and environmental dimensions) serve as a basis for design and preparation of policy and project work. Profiles include data about the type of communities, demographic characteristics, economy and livelihood, land tenure and natural resource control, social organisation, factors affecting access to power and resources, conflict resolution mechanisms and values and perceptions. Together with a participation plan, the socio-cultural profile helps to ensure that proposed projects and policies are culturally and socially appropriate, and potentially sustainable.

Phase II: EIA Preparation

Because most EIA's for upstream projects are short term in nature, the nature and significance of impacts related to upstream projects is now fairly understood, and detailed procedures for preparation of EIA's for upstream projects have been developed. Consultations during EIA preparation on the methodology and findings will not be necessary, unless special cases (like new projects in highly sensitive areas) require otherwise. However, proponents would need to ensure that the EIA's are technically correct and complete and as per the ToR agreed upon with the stakeholders. If need be, draft copies of the EIA can be circulated for review and comments prior to formal submission to the EPA.

Phase III: Public Hearing

The public hearing will provide a forum for the post submission consultation on the EIA. As detailed in Chapter 4 of Part III of the Guidelines, the EPA within 10 days of the submission of the EIA will publish a public notice in any English or Urdu national newspaper and in a local newspaper of general circulation in the area affected by the project. The concerned EPA will fix a date (not be earlier than 30 days from the date of publication of the public notice) and venue for the public hearing.

The circulation of the EIA reports, gathering of comments on EIA, and ensuring public participation during public hearings will be the responsibility of the concerned EPA. The

venue and date proposed in the public notice cannot be changed, unless absolutely necessary owing to reasons beyond the control of the EPA (such as acts of God, safety and security concerns etc). If a venue or date is changed a new venue and date is to be published in a new public notice but keeping into consideration the proponent's commitments to project deadlines.

The public hearing should preferably be held at the town/city nearest to the project area with representatives from government agencies, academia, and prominent NGO's based outside of the project area also attending. Cost-effective and communal logistics (buses, coasters etc) can be arranged for the participants and the proponent can facilitate the EPA to the extent possible in this regard.

In case attendance at the public hearing is poor, the EPA will follow up on the comments of the stakeholders after the public hearing and include these in its decision on the EIA but will not abort the public hearing on the premise of poor attendance.

During the public hearing the proponent will present the details of the company, the environmental management systems and policies of the company, the proposed project, past exploration and production in the same project area, and current and future community development programmes. This will be followed by a presentation on the key findings of the EIA and the EMP. After the presentations, participants can comment on the proposed project, proponent's past performance, and the findings of the EIA. Not all comments from the public may be relevant to the occasion and the EPA will have to facilitate discussions and arbitrate any disputes.

Minutes of the proceedings of the public hearing will be prepared by the EPA and circulated to all participants within one week of the public hearing. The proponent may send written comments and answers to some of the comments raised during the hearing for additional clarification.

In order for public hearings to be successful and meaningful the atmosphere during the hearings should be that of participation and involvement and not hostility. Constructive criticism should be encouraged and undue criticism avoided.

Phase IV: Project Implementation

Public consultation will continue during project implementation to inform, and discuss with key stakeholders implementation of the EIA and findings of environmental monitoring. The level of consultation and techniques may vary, some previous examples of consultation techniques include meetings on-site; field visits by government agencies, academia and NGO's; monthly presentations to the EPA and other stakeholders; regular meetings with local communities; disseminating information brochures etc.

A minimum package of consultation during project implementation is detailed below. This can be modified or increased depending on the requirements of the project and the stakeholders:

- The proponent will prepare and submit monthly or quarterly environmental reports as applicable (see Chapter 3 of Part III of the Guidelines for details) to the EPA advisory committee who shall circulate the reports to concerned stakeholders
- The EPA advisory committee will review the reports and forward its comments to the proponent. If required the EPA can ask the proponent to discuss and present the report to the advisory committee at the EPA office or alternatively discuss this with the proponent during site visits or audits that the EPA may undertake. For proponents with existing exploration and production programme, it might not be possible to present and discuss monthly reports for each individual project and a realistic consultation plan should be devised in which quarterly meetings can be held at the EPA office or in the project area.
- The EPA advisory committee will visit the project area at least once during the project to audit and discuss with the proponent the environmental and social performance of the project.
- The proponent will develop a system of consulting with local communities, which may include discussions with key representatives from local communities (such as village elders etc) and maintaining a register of community complaints at the project site office.

Phase V: Project Closure

After project closure, end-of-project reports will be sent to the EPA advisory committee, which will include among other items status on compensation due to local communities and restoration of areas leased with local communities. The EPA advisory committee may comment on the end-of-project report and visit the project area to verify adequacy of restoration and payment of all dues to local communities.

7.5.3 Response to and reporting of consultation outcomes

The comments (concerns, suggestions etc) from stakeholders consulted and the proponent's response (which can either be an action, clarification or disagreement) to the comments will need to be reported in the EIA, monitoring reports and other relevant documents. This can be in textual or tabulated form but the latter is preferred. The reporting of each comment should include the name of the organisation or person from whom the comment was received; when and how was the consultation done; and proponent's response.

7.6 Institutional Roles and Responsibilities

Public consultation is a two-way process, which requires involvement and commitment from both parties (those who are consulting and those from whom consultation is sought). Guidance on the roles and responsibilities of a few key organisations is included in the guidelines to enable improvement in the consultation process.

7.6.1 Role of the proponent

The proponent holds the primary responsibility for consulting with the stakeholders on the design, location and implementation of the project; scope, methodology and findings of the EIA; and environmental performance of the project and the findings of the environmental monitoring. The proponent will need to ensure that all concerned key stakeholders are identified, they are consulted in a manner, which allows two-way flow of information, comments of the stakeholders are addressed, and consultation outcome is reported in a fair and transparent manner.

7.6.2 Role of EPA

Apart from being a key stakeholder to the process the EPA advisory committee will need to facilitate the consultation process, especially in the case of public hearings. According to the US EPA (2000), "facilitation" is a process used to help a group of people or parties to have constructive discussions about complex, or potentially controversial issues. The facilitator can provide assistance by helping the parties set ground rules for these discussions, promoting effective communication, and keeping the group focused and on track (Hughes 1998). The EPA will also need to review the completeness and effectiveness of the consultation programmes and provides feedback in a timely manner to the proponent.

7.6.3 Role of NGO's and Associations

The NGO's and relevant associations (such as Pakistan Environment Assessment Association) can act as independent parties who not only represent the interests of local communities and the protection and conservation of biodiversity but also act as independent reviewers to the consultation process. They can help identify best practices and guidelines for improvement and partner with proponent's in enhancement and compensation programmes where possibilities of mutual work exist to bring about positive benefits to the local communities and to biodiversity.

7.7 Constraints to Stakeholders' Involvement

Stakeholders' involvement in EIA processes can be constrained by many factors varying according to circumstances and contexts. Some factors are detailed below, these should be considered in the planning and design of consultation programmes by proponents and by the EPA's and NGO's in their review of the consultation programme:

7.7.1 Time and Money

Additional time and money are required during planning to achieve higher levels of stakeholder involvement. Both commodities are generally in short supply for environmental assessment. A recent survey of EIA professionals worldwide found that 81% of respondents believed time deadlines to be limiting, and 61% believed that budget constraints were generally very limiting (Sadler, 1996).

7.7.2 Gender

Insensitivity to gender issues, and particularly to the lower status accorded to women in decision-making in many parts of Pakistan, is a common constraint to effective stakeholder involvement. In rural parts of Pakistan, the non- inclusion of women seriously hampers the process of effective stakeholders involvement.

7.7.3 Education

Low levels of education and the 'technical' nature of many development-related issues can be a major barrier to effective participation in EIAs.

For example, a villager in Bangladesh, when asked whether he had 'participated' in the EIA process for a major flood control and irrigation project that would radically alter his livelihood prospects, responded thus: *'If I were to be consulted what would I say? You see I'm just an ordinary man. I don't know anything. All I know is that one has to have meals every day.'* (Adnan et al, 1992).

7.7.4 Physical Remoteness

It is costly and time consuming for practitioners to reach small, diverse and scattered groups in remote areas, and conversely, it is difficult for the inhabitants of such areas to gain access to information relevant to development plans and to EIAs.

7.7.5 Cultural Differences

For most of the social scientist, the issue of culture differences pose a serious threat to development activities. These can be particularly acute where 'indigenous groups' are stakeholders in the EIAs process. Communication difficulties may arise not simply because of language and education, but primarily because indigenous groups often hold entirely different belief systems and ways of perceiving issues.

7.7.6 Mistrust and Elitism

Mistrust may pervade the relationship between project proponents and different stakeholder groups. In some cases, this derives from past experience or conditioning. Elitism or patriarchal approaches can also pose a constraint – many agencies and proponents adopt *'we know better' approaches*, and do not accept that stakeholder involvement can improve the quality of development initiatives.

7.7.7 Conflicting resource management rights

Disputes over land and water rights and, more specifically, disputes over who has the right to sanction developments, are common in some regions of the world. Deep-rooted conflicts between customary and national land tenure rights in northern Tanzania, for example, have undermined several attempts to involve local people in local planning and development (Lane, 1994).

7.7.8 Project size

Achieving effective stakeholder involvement can be much more difficult for large sized projects or projects with large spatial spread.

7.7.9 Community Burn-out

There is a tendency to assume that people are only too willing to participate. Reflecting on an experience in Tanzania, one EIA practitioner remarked:

“People have been subjected to so much social evaluation; people get fed-up. So people are not interested; they think that we are wasting their time and they have work to do...” (Mwalyosi, cited by Guilanpour, 1994).

In some areas, local communities have been overburdened with officials, planners, social scientists and researchers requiring their inputs. Often such communities have seen rather little in return for their inputs, and well justified scepticism and reluctance to engage further has been the end result. In such cases, the potential for future stakeholder involvement is significantly constrained and will require a prolonged phase of trust building and commitment if these attitudes are to be replaced by one of open commitment.

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