

DRAFT

**Guidelines for
Environmental Impact Assessment Review of
Public Sector Projects
For Balochistan Environmental Protection Agency
GOVERNMENT OF BALOCHISTAN**

Developed by
IUCN Balochistan Programme

The World Conservation Union



1. Introduction

EIA is an analysis that identifies the potential environmental and social impacts of a specific project in its area of influence; examines alternatives to the project; identifies ways of improving project's site selection, planning, designing, and implementation in order to prevent, minimize, mitigate, or compensate for adverse environmental and social impacts and enhance positive impacts; and includes the process of mitigating and managing adverse environmental and social impacts during the implementation of a project. The formalised arrangements for implementation of EIA system in Pakistan evolved over a period of fifteen years. It started with the promulgation of Pakistan Environmental Protection Ordinance (PEPO) of 1983 (repealed in 1997), notification of NEQS in 1993 and their revision in 1999, documentation of procedural and sectoral guidelines as EIA Package in 1997, enactment of PEPA'1997 followed by IEE/EIA Regulations of 2000 and finally the launch of National Environmental Policy in 2005, which describes integration of environment into development planning through implementation of EIA at project level and promotion of strategic environmental assessment (SEA) as a tool for integrating environment into decision-making.

Environmental impact assessment of all development projects whether public or private is a legal requirement under section 12 of Pakistan Environmental Protection Act of 1997, which became operational with *Pak-EPA (Review of IEE/EIA) Regulations, 2000* notified through S.R.O. 339(1) of 2001. The Regulations also listed the project categories, which require an IEE in its Schedule-I and the projects for which an EIA is required are in Schedule-II. For projects not listed in Schedule I and II, filing an IEE or EIA is not required, unless the project is likely to cause an adverse environmental effect and the projects for which EPA has issued guidelines for construction and operation, an application for approval accompanied by an undertaking and an affidavit that the aforesaid guidelines will be followed is required. The scope and level of detail in an EIA should be commensurate with a project's potential impact. At a minimum, an EIA should include the information outlined in Guidelines for the preparation and review of Environmental Reports provided in Pakistan Environmental Assessment Procedures, 1997.

The World Bank in its Country Strategic Environmental Assessment Report of 2005 described about Pakistan, that:

“The quality of the EIA reports submitted to EPAs by the project proponents or developers vary considerably; reports for large projects being developed by multinational organizations and donor agencies are generally thorough, but those for smaller projects tend to be vague. Although many EIA reports mention alternatives, including the no-project option, this appears to be a mere formality. Alternatives are not analyzed seriously as the EIA review system is poor both at the proponent's end and inadequate at the EPAs. There is no formal system of EIA review or review panels comprising experts from various fields have not been formed as EPAs do not have financial resources to support that system by paying honoraria or fee to the reviewers and to spend on cost of communication. The cost of mitigation measures proposed by the consultants or experts is

never looked into realistically. Normally, one person with no formal training or experience in environmental assessment reviews EIA reports. Most of the staff members in EPAs related to EIA are engineers; therefore, economic appraisal and valuation of environmental resources and social benefits in relation to ecological impacts are rarely taken into account due to inability of the evaluators to appreciate the principles of economics and sociology on one hand and the issues of the green environment on the other. The information provided in the EIA does not appear to be used in decision-making process in most cases. Decisions are generally made before an EIA is conducted, and the EIA is then tailored around what has already been decided”.

Thus, the development of policy, institutional, legal and regulatory frameworks has created a good framework for environmental governance that can sufficiently support the EIA system in the country; despite all these measures the EIA system is still not very effective in Pakistan, particularly in public sector development projects. Not only in terms of its implementation but also in terms of its review and appraisal of issues while making decisions, and its evaluation through post-decision monitoring by the government.

Institutional capacity building is one of the prerequisites of sustainable development in Pakistan and is IUCN's key approach towards programme implementation by providing technical assistance within the framework of Balochistan Conservation Strategy (BCS) developed by the Government of Balochistan with the technical assistance from IUCN and financial support from Royal Netherlands Embassy in Pakistan in the year 2000. Therefore, IUCN Balochistan Programme developed these guidelines for review EIA by the BEPA in order to strengthen the EIA system.

Objectives

The overarching aim of developing these guidelines is the institutional capacity building of Government of Balochistan for implementing Balochistan Conservation Strategy by promoting environmentally sound decision making. Providing ready reference environmental review checklist as a tool to the staff of Balochistan Environmental Protection Agency for strengthening EIA system is the specific objectives. These guidelines are intended to assist Balochistan Environmental Protection Agency in reviewing the IEE or EIA reports for a sound decision making. For further facilitation, a glossary of the technical terms is also given in the end.

Methodology

An initial need assessment was carried out by holding meeting with the relevant staff of the Balochistan Environmental Protection Agency in order to identify the needs for strengthening environmental review process IEE/EIA reports submitted to BEPA. Then IUCN Balochistan Programme was formally requested by the BEPA to extend assistance in formulating specific guidelines for review of the IEE/EIA reports for effective implementation of Pak-EPA (Review of IEE/EIA) Regulations, 2000. On the basis of the issues appraised, an initial checklist was

shared with the staff of the BEPA dealing with implementation of environmental assessment and their feedback was recorded. There re two tools developed for BEPA, one is **Environmental Review Checklist** for EIA reports submitted to BEPA and the second is post-approval **Environmental Monitoring Forms** for monitoring compliance. A glossary of commonly used terminology in EIA is also provided for quick reference to facilitate the reviewing person.

Balochistan Environmental Protection Agency

ENVIRONMENTAL REVIEW CHECKLIST For Infrastructure Projects (Railroad, Bridge, Water Supply, Sewerage, etc.)

Item	Considered	Impacts anticipated & mitigation measures given
1. NATURAL ENVIRONMENT		
	Yes/No	
Air pollution Do the sulfur oxides (SO _x), nitrogen oxides (NO _x), particulate matter, and other air pollutants emitted comply with NEQS?		
Effluent Do effluents comply with the NEQS		
Wastes Has careful consideration been given to the methods for treatment and disposal of general wastes and industrial wastes? Do wastes comply with NEQS?		
Noise and vibration Are the NEQS for noise and vibration complied with?		
Topography and geology Is there a possibility that large scale site preparation will adversely change the topographical and geologic features? Has sufficient consideration been given to soil runoff, soil stability and slope protection for land modification including cut and fill?		
Soil contamination Has the soil on or around the project site been contaminated in the past, and have measures been effected so as not to contaminate it in future?		
Hydrology Is there a possibility that changes in groundwater systems by modifications in the land, or changes in surface river systems by the building of structures, will adversely affect the hydrology or water use?		
Ecosystem Does the project site encompass the valuable habitats of wildlife, plants, or aquatic life?		

<p>Landscape Are adverse effects on landscape anticipated?</p>		
<p>Regional development Does construction of infrastructure facilities in undeveloped areas involve the possibility of major damage to the natural environment caused by new regional development after construction?</p>		
<p>Sunlight shading and radio interference Is there a possibility that road structures will cause sunlight shading or radio interference?</p>		
<p>Impacts during construction Has sufficient consideration been accorded to measures for the mitigation of noise, vibration, turbid water, dust, exhaust gases, and other impacts during construction?</p>		
<p>Other impacts Are other project specific negative impacts anticipated? If impacts are anticipated, has sufficient consideration been accorded to measures for the mitigation?</p>		
<p>2. SOCIAL ENVIRONMENT</p>		
<p>Consideration to inhabitants; NGOs Have the affected people and other people living around the area been given explanations, and agreement has been made? Have the inhabitants been given proper compensation, and have efforts been made to minimize the project's effects through means such as guaranteeing their post-relocation means of livelihood?</p>		
<p>Cultural heritage Is there any possibility that the project will damage properties or historical sites that are of great historical, cultural, or religious value?</p>		
<p>Regional development Does construction of infrastructure facilities in undeveloped areas involve the possibility of major damage to the lives of local inhabitants caused by new regional development after construction?</p>		
<p>3. MONITORING</p>		
<p>What specific kinds of monitoring plans are there?</p>		

Is this plan judged to be appropriate? Has a sufficient monitoring plan been prepared for the important items described below:		
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Balochistan Environmental Protection Agency

ENVIRONMENTAL MONITORING FORM (Infrastructure Development Projects)

Emission/Discharge Standards Item

Classification		Measurement Value			NEQS Value	Remarks
AIR		Max	Min	Ave		
Item	SO ₂					
	NO ₂					
	CO ₂					
	O ₂					
	Total Solids					
	Suspended Particulate Matter					
Measurement Point	Chimney Exit					
Frequency	Continuous Measurement					
WASTE WATER		Max	Min	Ave		
Item	pH					
	Suspended Solid(SS)					
	BOD					
	COD					
Measurement Point	Discharge Water Outlet					
Frequency	x / year					

Note: Monitoring item, Measurement Point, and Frequency shall be decided in discussion with proponent, since they depend on local environmental conditions.

Balochistan Environmental Protection Agency

ENVIRONMENTAL REVIEW CHECKLIST For Petroleum/Natural Gas Development Projects

Item	Considered	Impacts anticipated & mitigation measures given
1. NATURAL ENVIRONMENT		
Yes/No		
<p>Air pollution Do sulphur oxides (SOx), nitrogen oxides (NOx), particulate matter, and other air pollutants emitted from production and processing facilities comply with the NEQS?</p>		
<p>Well drilling sites Are drilling mud used for a drilling fluid and rock cuttings generated by drilling properly treated? In offshore oil and gas fields, is there a possibility that drilling will adversely affect fishing grounds or marine life by disposal of mud water and rock cuttings or pollute the sea? In onshore and gas fields, is there a possibility that drilling will contaminate the soil by disposal of mud water and rock cuttings?</p>		
<p>Oil wells Has adequate consideration been given to safety measures, monitoring systems (especially dealing with blowout), and crude oil spills in the vicinity of oil production wells?</p>		
<p>Production and processing facilities Do the processing and disposal of effluents, sludge, and other substances discharged from production and processing facilities comply with the NEQS?</p>		
<p>Noise and vibration Are the NEQS for noise and vibration standards complied with?</p>		
<p>Pipelines Is there a possibility that the installation of facilities will adversely affect wildlife or the ecosystem?</p>		
<p>Soil contamination</p>		

<p>Has the soil on or around the plant site been contaminated in the past, and have measures been effected so as not to contaminate it in future?</p>		
<p>Oil and gas loading ports Are negative impacts on coral reefs, mangroves, and other aquatic life anticipated from the construction of port and harbour facilities?</p> <p>Are adverse effects on fisheries anticipated?</p>		
<p>Ecosystem Does the project site encompass the valuable habitats of wildlife, plants, or aquatic life?</p>		
<p>Landscape Are adverse effects on landscape anticipated?</p>		
<p>Impacts during construction Has sufficient consideration been accorded to measures for the mitigation of noise, vibration, turbid water, dust, exhaust gases, and other impacts during facility construction?</p>		
<p>2. SOCIAL ENVIRONMENT</p>		
<p>Consideration to inhabitants; NGOs Have the affected people and other people living around the area been given explanations, and agreement has been made?</p> <p>Have the inhabitants been given proper compensation, and have efforts been made to minimize the project's effects through means such as guaranteeing their post-relocation means of livelihood?</p>		
<p>Cultural heritage Is there any possibility that the project will damage properties or historical sites that are of great historical, cultural, or religious value?</p>		
<p>3. MONITORING</p>		
<p>What specific kinds of monitoring plans are there? Is this plan judged to be appropriate?</p> <p>Has a sufficient monitoring plan been</p>		

prepared for the important items?		
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Balochistan Environmental Protection Agency

ENVIRONMENTAL MONITORING FORM

(Petroleum/Natural Gas Development Projects)

Emission/Discharge Standards Item

Classification		Measurement Value			NEQS Value	Remarks
Air		Max	Min	Ave		
Item	SO ₂					
	NO ₂					
	CO ₂					
	O ₂					
	Total Solids					
	Suspended Particulate Matter					
Measurement Point	Discharge Outlet					
Frequency	Continuous Measurement					
General Waste Water		Max	Min	Ave		
Item	pH					
	Suspended Solid (SS)					
	BOD					
	COD					
	Mineral Oil					
Measurement Point	Discharge Water Outlet					
Frequency	x /month					

Note: Monitoring item, Measurement Point, and Frequency shall be decided in discussion with proponent, since they depend on local environmental conditions.

Balochistan Environmental Protection Agency

ENVIRONMENTAL REVIEW CHECKLIST For General Industry Projects

Item	Considered	Impacts anticipated & mitigation measures given
1. NATURAL ENVIRONMENT	Yes/No	
<p>Air pollution Do the sulphur oxides (SO_x), nitrogen oxides (NO_x), particulate matter, and other air pollutants emitted comply with NEQS?</p>		
<p>Effluent Do effluents comply with the NEQS?</p>		
<p>Wastes Has careful consideration been given to the methods for treatment and disposal of general wastes and industrial wastes? Do wastes comply with the country's standards?</p>		
<p>Noise and vibration Are the country's noise and vibration standards complied with?</p>		
<p>Odors Is there any consideration for the effects of odors and means to deal with them?</p>		
<p>Accident prevention measures Have adequate provisions (installing prevention facilities and equipment, setting up a prevention and management system) been made to prevent accidents involving dangerous goods? Has adequate consideration been accorded to emergency measures in case of an accident?</p>		
<p>Port and harbour facilities Are negative impacts on coral reefs, mangroves, and other aquatic life anticipated from the construction of port and harbour facilities? Are adverse effects on fisheries anticipated?</p>		
<p>Soil contamination Has the soil on or around the project site been contaminated in the past, and have</p>		

measures been effected so as not to contaminate it in future?		
Landfills Are negative impacts on aquatic life anticipated from landfills? Are adverse effects on fisheries anticipated?		
Water use Is there a possibility that the use of water (seawater, freshwater, groundwater) by this project will adversely affect land subsidence marine or riparian environments, fisheries, or water use by regional inhabitants?		
Ecosystem Does the project site encompass the valuable habitats of wildlife, plants, or aquatic life?		
Landscape Are adverse effects on landscape anticipated?		
Impacts during construction Has sufficient consideration been accorded to measures for the mitigation of noise, vibration, turbid water, dust, exhaust gases, and other impacts during construction?		
Other impacts Are other project specific negative impacts anticipated? If the impacts are anticipated, has sufficient consideration been accorded to measures for the mitigation?		
2. SOCIAL ENVIRONMENT		
Consideration to inhabitants; NGOs Have the affected people and other people living around the area been given explanations, and agreement has been made? Have the inhabitants been given proper compensation, and have efforts been made to minimize the project's effects through means such as guaranteeing their post-relocation means of livelihood?		
Cultural heritage		

Is there any possibility that the project will damage properties or historical sites that are of great historical, cultural, or religious value?		
3. MONITORING		
Specifically, what kinds of monitoring plans are there? Is this plan judged to be appropriate? Has a sufficient monitoring plan been prepared for the important items?		

Balochistan Environmental Protection Agency

**ENVIRONMENTAL MONITORING FORM
For General Industry**

Emission/Discharge Standards Item

Classification		Measurement Value			NEQS Value	Remarks
Air		Max	Min	Ave		
Item	SO ₂					
	NO ₂					
	CO ₂					
	O ₂					
	Total Solids					
	Suspended Particulate Matter					
Measurement Point	Chimney Exit					
General Waste Water		Max	Min	Ave		
Item	pH					
	Suspended Solid(SS)					
	BOD					
	COD					
Measurement Point	Discharge Water Outlet					

Note:

Monitoring item, Measurement Point, and Frequency shall be decided in discussion with proponent, since they depend on nature and location of project.

Glossary of common technical terms used in EIA

A

A-weighting - A frequency-weighting method (see frequency-weighted sound pressure) in which the measurement process includes filtering of the signals to approximate the response of human hearing with respect to the sound spectrum.

Abiogenic - Not produced by the action of living organisms.

Abiotic - Non-living, e.g., the abiotic environment is the nonliving, physical portion of the environment such as rock, soil (excluding microbes), water, and air.

ADT - Annual average daily traffic. The average daily motor vehicle traffic at a specific point. Usually based on traffic counts on representative days. Unless otherwise specified the count includes traffic in both directions for an average day for the subject calendar year. The count may distinguish between autos, medium trucks, and heavy trucks.

Alluvial - Pertaining to or composed of alluvium, or deposited by a stream or running water. Relating to, composed of, or found in alluvium, which is unconsolidated, poorly sorted, detrital sediments ranging from clay to gravel sizes and characteristically fluvial in origin.

Amatol - An explosive consisting of ammonium nitrate and trinitrotoluene.

Ambient Sound - At a specified time, the all-encompassing sound associated with a given environment, being usually a composite of sound from many sources at many directions, near and far, including the specific sound source(s) of interest.

Ammonium Nitrate - A colourless crystalline salt ($N_2H_4O_3$) used in explosives, fertilizers, and veterinary medicine.

Amphibian - Cold-blooded, smooth-skinned animals of the class Amphibia, including frogs, toads, and salamanders, characteristically hatching as aquatic larvae that breathe by means of gills and metamorphose to an adult form having air-breathing lungs.

Amphipod - Small aquatic crustaceans in the Order Amphipoda commonly referred to as scuds or side swimmers

ANSI - American National Standards Institute, a voluntary standards organization, U.S. Secretariat for International Standards Organization (ISO).

Aquifer - Rock or sediment in a formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Archival - Relating to, contained in, or constituting archives, which are places where generally unpublished public records or historical documents are preserved.

Arthropoda - A phylum (the second highest level of taxonomic classification) in the animal kingdom, which includes numerous invertebrate organisms such as insects, spiders, and crustaceans. Organisms in this phylum are characterized by a hard, segmented external covering and segmented limbs.

ASTM - A voluntary consensus standards organization, formerly American Society for Testing and Materials.

B

Background noise - The total acoustical and electrical noise, from all sources in a measurement system, that may interfere with the production, transmission, time averaging, measurement, or recording of an acoustical signal.

Background sound - All-encompassing sound associated with a given environment without contributions from the source or sources of interest. Background sound is described as a combination of (1) long-term background sounds and (2) short term background sounds, with the durations for long and short defined according to application and situation. Long term background sound is that sound that is measured over a specific time period. It does not include short-term background sound, or the sound of a specific source as dominant features. Short-term background sound is associated with one or more sound events that occur infrequently during an observation period. Examples of short term sounds are those from such sources as a nearby barking dog, accelerating motor vehicle, radio music, siren, or aircraft flyover.

Biomass - Literally, "living weight", refers to mass having its origin as living organisms (i.e., plants or animals).

Biome - Recognizable community units formed by the interaction of regional climate, regional biota, and substrate. (e.g., The same biome units generally can be found on different continents at the same latitudes that produce about the same weather conditions and where topography is similar. Biomes are the largest land community units recognized.

Biota - Living organisms including plants and animals

Booster - The final high-explosive component of an explosive train that amplifies the detonation from the lead or detonator. Thus, a booster charge reliably detonates the main high-explosive charge of the munitions.

C-weighting - Similar to A-weighting but with less discrimination against low-frequency sound. Appropriately used in measurement of high-level sounds and impulsive sounds.

C

Calcrete - a conglomerate consisting of surficial sand and gravel cemented into a hard mass by calcium carbonate precipitated from solution by infiltrating waters or deposited by the escape of carbon dioxide from vadose water.

Caliche - gravel, sand or desert debris cemented by porous calcium carbonate; also the calcium carbonate itself.

Carbonate - A mineral compound characterized by a fundamental anionic structure of CO₃²⁻.

Casing Head Gas - A gaseous by-product of oil production that is produced from fluid hydrocarbons at the casing head of an oil well.

Central Flyway - A major migratory route used by large numbers of migrating birds in fall and spring that crosses the central portion of North America from Canada to Mexico.

Centripetal drainage - The flows of water in a basin toward a central drains or sinks, such as a pond or lake.

Condensate - The liquid hydrocarbon produced by condensation of natural gas in natural gas wells.

Context - An attribute of cultural resources consisting of their relationships to time, space, and human behavior.

Context Statement - A written document describing the unique relationships of specific cultural resources to time, space, and human behavior. They are developed to support the Section 106 review process under the National Historic Preservation Act.

Crustaceans - Organisms, generally aquatic, belonging to the taxonomic class Crustacea, which includes crayfish, crabs, shrimp and lobsters, characteristically having a segmented body, a hard external covering, and paired jointed limbs.

Cultural Resources - Districts, sites, structures, and objects and evidence of some importance to a culture, a subculture, or a community for scientific, traditional, religious, and other reasons. These resources and relevant environmental data are important for describing and reconstructing past life ways, for interpreting human behavior, and for predicting future courses of cultural development.

D

Day-night sound exposure (Total) - The sound exposure for a 24-hour calendar day calculated by adding the sound exposure obtained during the daytime (0700-2200 hours) to ten times the sound exposure obtained during the nighttime (0000-0700 and 2200-2400 hours). The frequency weighting shall be stated; otherwise, the A-weighting will be understood. Unit: pascal-squared second (PA² s).

Day-night sound exposure level (Total) - Ten times the common logarithm of the ratio of the (total) day-night sound exposure to the reference sound exposure (E₀) of 400 micropascals-squared seconds (400 mPa² s). Unit decibel (dB).

Diatomaceous Earth - A light, friable, siliceous material derived chiefly from diatom remains and used especially as a filter.

Dolomite - A mineral consisting of a calcium magnesium carbonate [CaMg (CO₃)₂] found in crystals and in extensive beds as a compact limestone.

E

Ecosystem - Living organisms and their nonliving (abiotic) environment functioning together as a community.

Ecotype - Populations of species with wide geographical ranges that have adapted optima and limits of tolerances adjusted to local conditions.

Emergent vegetation - Vegetation that grows with its roots under water but whose leaves and stems extend above the surface of the water.

Eolian - Pertaining to the wind; especially said of such deposits as loess and dune sand, of sedimentary structures such as wind-formed ripple marks, or of erosion and deposition accomplished by the wind.

Ephemeral - Lasting only a short period of time.

Ephemeral - Used in this document to describe water bodies that often do not have water year round. Typically, these water bodies have water following the wet seasons then dry up during the dry seasons.

Escarpment - A long, more or less continuous cliff or relatively steep slope facing in one general direction, separating two level or gently sloping surfaces, and produced by erosion or faulting.

Evaporite - One of the sediments deposited from aqueous solution as a result of extensive or total evaporation.

Evapotranspiration - The sum of evaporation, the process by which water passes from the liquid to the vapor state, and transpiration, the process by which plants give off water vapor through their leaves.

Exceedance level - Sometimes used instead of the term "percentile level".

F

Facultative species - Plant species that are more or less equally likely to occur in wetlands or uplands (i.e., a species that is classified as facultative would be found in wetlands from 33% and 66% of the time). (symbol used for these plants is FAC)

Facultative wetland species - Plant species that occur more frequently in wetlands than on uplands or non-wetlands (i.e., a species that is classified as facultative wetland would be found in wetlands from 66% to 99% of the time). (symbol used for these plants is FACW; plants near the higher end of occurrence in wetlands are often designated FACW+; those near the lower end of occurrence in wetlands are designated FACW-)

Flint - A fine grained, very hard quartz.

Fluvial erosion - The weathering away of soil and rock by the action of a stream or river.

Fluvial - Of or pertaining to rivers; growing or living in a stream or river; produced by the action of a stream or river.

Frequency-weighted sound pressure - root mean square of the instantaneous sound pressure filtered (frequency weighted) with a standard frequency characteristic (e.g., A or C) and exponential time weighted in accordance with the standardized characteristics slow (S), fast (F), impulse (I), or peak; both weightings as specified in ANSI S1.4A-1985. The time weighting shall be specified. The frequency weighting should be specified; otherwise, A-weighting will be understood. Unit: pascal (Pa).

G

Genome – The genetic information contained in the body of an organism.

Genus - A taxonomic category ranking for classifying living organisms. Genus is below family but above a species. The scientific name of an organism consists of its genus and species.

Gravimetric - of or relating to measurement by weight.

H

Hazardous Waste - Defined by 40 CFR Part 261, as any material that a) is a solid waste, and b) is a listed hazardous waste (Subpart D), or c) exhibits any of the characteristics of ignitibility, corrosivity, reactivity or toxicity (Subpart C).

Herbicide - A substance (usually chemical) used to destroy undesirable plants.

Herpetofauna - Reptiles (snakes, turtles, lizards, etc.) and amphibians (frogs, toads, salamanders)

Hydroperiod - The typical cycle for playas and other water bodies describing the length of time during which they have water

Hydrostratigraphic unit - A formation, part of a formation, or a group of formations in which there are similar hydrologic characteristics that allow for a grouping into aquifers and associated confining layers.

I

Insecticide - A substance (usually chemical) used to destroy undesirable insects.

Intrusive sound - Sound that is sufficiently loud to be heard over the long-term background in the absence of short-term sound. Intrusive sound is usually short-term. If it persists continuously, it could be considered part of the background, and the background sound level would take on a higher value.

Invertebrate - Animals characterized by not having a backbone or spinal column, including a wide variety of organisms such as insects, spiders, worms, clams, crayfish, etc.

Isotope - Any of two or more species of atoms of a chemical element with the same atomic number and position in the periodic table and nearly identical chemical behavior but with differing atomic mass number and different physical properties.

L

Lacustrine - pertaining to, produced by, or inhabiting a lake or lakes.

Lagomorph - Any of the various gnawing mammals in the order Lagomorpha, including rabbits, hares, and pikas.

Landsat imagery - Multi-spectral satellite images (non-photographic) of the earth's surface which can be enhanced and used for identification and description of surface features.

Lithology - Lithology is the description of rocks made on the basis of such characteristics as color, mineralogic composition, and grain size.

Loam - A rich, permeable soil composed of a mixture of clay, silt, sand, and organic matter.

M

Macroinvertebrate - Invertebrate organisms (i.e., organisms without backbones) that are large enough to be seen with the naked eye.

Mammal - Animals in the class Mammalia that are distinguished by having self-regulating body temperature, hair, and in females, milk-producing mammary glands to feed their young.

Mitigation - The alleviation of adverse impacts on cultural resources by avoidance through project redesign or project relocation, by protection, or by adequate scientific study.

Mortuary Remains - Human physical remains and associated artifacts that exist in prehistoric and historic temporal contexts.

N

Noise signature - A combination of unique tonal and/or loudness patterns that are peculiar to a specific noise source. An example would be the noise signature of an aircraft. Experienced observers can often identify the type of aircraft by its noise signature.

Noise - Unwanted or undesirable sound, usually characterized as being so loud as to interfere with, or be inappropriate to, normal activities such as communication, sleep, study or recreation. (See background noise.)

O

Obligate species - Plant species that almost always occur in wetlands (i.e., greater than 99% of the time; symbol used for these plants is OBL).

Octave band - A band of frequencies in which the upper band limit is very nearly 2 times the lower band limit (within 2%). The preferred octave bands related to audible sound are defined in ANSI S1.6-1984 (see references for title). Audible sound is considered to fall in Band #13 through Band #43, an overall frequency ratio of 1000 (20 Hz through 20 kHz). It is standard practice to use band numbers for band identification; however, common practice is to use the geometric mean frequency to identify octave bands. By this practice, the band commonly known as the 1000 Hz octave band (Band #30) is the band of frequencies between 707.11 Hz and 1414.22 Hz.

Off-Normal Event - Abnormal or unplanned events or conditions that adversely affect, potentially affect, or are indicative of degradation in, the safety, security, environmental or health protection performance or operation of a facility.

P

Paleosol - A buried soil; a soil of the past.

Pedogenic - From pedogenesis; soil formation.

Percentile level - Sound level or time-average sound level that is exceeded for X percent of the total measurement period. The duration of the total measurement period shall be stated. The frequency weighting shall be specified; otherwise A-weighting shall be understood. If sound level is used then the time weighting shall be specified. If time-average sound level is used, then the measurement time period of the sample shall be stated. Unit: decibel, dB.

Perched aquifer - Groundwater separated from the underlying main body of ground water, or aquifer, by unsaturated rock.

Peripheral zone - The zone surrounding the playas, which is just higher in elevation than the playa floor

Pollution Prevention - Involves recycling or reduction of any hazardous substance, pollutant, or contaminant before generation.

Potable - Suitable for drinking.

Process Knowledge - Process knowledge is used to characterize a waste stream when it is difficult to sample because of physical form, the waste is too heterogeneous to be characterized by one set of samples, or the sampling and analysis of the waste stream results in unacceptable risks of radiation exposure.

Protistans - Single-celled organisms not readily classified as plant or animal and therefore sometimes placed in a third new kingdom Protista.

R

Raptor - Birds of prey including various types of hawks, falcons, eagles, vultures, and owls

Residual sound - At a specified time, the all-encompassing sound, being usually a composite of sound from many sources at many directions, near and far, remaining at a given position in a given situation when all uniquely identifiable discrete sound sources are eliminated, rendered insignificant, or otherwise not included. Residual sound may be approximated by the percentile sound level exceeded during 90-95 percent of the measurement period.

Riverine - Of or pertaining to a river, e.g., riverine habitat is habitat occurring along a river.

S

Saturated zone - The zone in which the voids in the rock or soil are filled with water at a pressure greater than atmospheric. The water table is the top of the saturated zone in an unconfined aquifer.

Seining - A technique using a net drawn through the water to sample the organisms occurring in a particular water body submerging vegetation - plant species that grow entirely under water

Slug test - An aquifer test made either by pouring a small instantaneous charge of water into a well or by withdrawing a slug of water from the well. The rate of recovery of the water table to equilibrium conditions is monitored as the stress is applied to the aquifer. Information from slug tests can be used to estimate the hydraulic conductivity of the aquifer.

Sound pressure level - Ten times the common logarithm of the square of the ratio of the sound pressure to the reference sound pressure of 20 micropascals. Unit: decibel (dB).

Sound emission - Radiation of acoustic energy in the audible frequency range (20 Hz to 20 kHz). Acoustic energy incident on a specific location.

Sound level - Ten times the common logarithm of the square of the ratio of the frequency-weighted (and time averaged) sound pressure to the reference sound pressure of 20 micropascals. Unit: decibel (dB).

Sound pressure - Root mean square of the instantaneous sound pressures in a stated frequency band and during a specified time interval, unless another time-averaging process is indicated. Unit: Pascal (Pa). Instantaneous sound pressure is the total instantaneous pressure, in a stated frequency band, at a point in the presence of a sound wave minus the atmospheric static pressure at that point. Unit: pascal (Pa).

Sound receptor - A location, activity, person, or animal that is exposed, or potentially exposed, to acoustic energy

Stratigraphic - Of, relating to, or determined by stratigraphy; the superposition of layers (soil, rock, and other materials) often observed at archaeological sites.

T

Taxa - Species of animal or plant

Tertiary roads - All roads which provide access from the primary and secondary roads to individual areas or facilities in a functional area.

Tertiary - The first period of the Cenozoic era (after the Cretaceous of the Mesozoic era and before the Quaternary) thought to have covered the span of time between 65 and 2 Ma; also, the corresponding system of rocks.

Theis method - Method of analyzing aquifer test data based on the Theis equation, an equation for the flow of groundwater in a fully confined aquifer.

Time-average (frequency-weighted) sound pressure - (a) Square root of the quotient of the time integral of frequency-weighted squared instantaneous sound pressures divided by the time period of integration in seconds; or (b) square root of the quotient of the sound exposure, in pascal-squared seconds, in a specified time period, divided by the time period of integration in seconds. Unit: pascal (Pa)

Time-average sound level - Ten times the common logarithm of the square of the ratio of time-average (frequency-weighted) sound pressure to the reference pressure of 20 micropascals. Unit: decibel (dB). The basic symbol is LT, however the symbol legend the abbreviation LEQ are frequently used. Time-averaged sound level is a single-number value that expresses the time-varying sound level for the specified period as though it were a constant sound level with the same total sound energy as the time-varying level.

Transuranic Waste (TRU) - Waste, without regard to source or form, that is contaminated with alpha-emitting radionuclides of atomic number greater than 92 (uranium) and with half-lives greater than 20 years in concentrations greater than 100 nanocuries per gram.

Traveler - Tracking form which is attached to low-level waste containers by the waste generators identifying the contents of that container.

Treatment, Storage, and Disposal Facility - Any facility that has been permitted by environmental regulations to treat, store, or dispose of hazardous wastes.

Triassic - The first period of the Mesozoic era (after the Permian of the Paleozoic era, and before the Jurassic) thought to have covered the span of time between 225 and 190 Ma; also, the corresponding system of rocks.

V

Vadose zone - Also called the unsaturated zone, the zone between the land surface and the water table. The pore spaces in the vadose zone contain water at less than atmospheric pressure, as well as air and other gases. Saturated bodies, such as perched groundwater, may exist in the vadose zone.

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Vertebrate - Animals that are members of the subphylum Vertebrata, including the fishes, amphibians, reptiles, birds, and mammals, all of which are characterized by having a segmented bony or cartilaginous spinal column.

W

Waste Tracking System Database - Computerized log maintained by the Waste Operations Department which includes information on the types of wastes, points of generation, the date the container was filled, the weight, and the date of transportation to the disposal site.

Weir - A fence or enclosure set in a waterway to raise the water level or to gauge or divert its flow.

Common Acronyms used in EIA

ALARA	As Low As Reasonably Achievable
EA	Environmental Assessment
EID	Environmental Information Document
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ER	Environmental Restoration
ES&H	Environment, Safety and Health
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
HE	High Explosives
IP	Implementation Plan
NOI	Notice of Intent
PEIS	Programmatic Environmental Impact Statement
PID	Programmatic Information Document
EISIP	Environmental Impact Statement & Implementation Plan
SAR	Safety Analysis Report
SID	Safety Information Document
SWEIS	Site-Wide Environmental Impact Statement