Environmental Impact Assessment (EIA) Report

Construction and Operation of Automotive Plant
District Lasbela, Balochistan

Premier Motors Limited

Final Report

May 2019

Environment, Health and Safety (EHS)

SGS Pakistan (Pvt.) Limited

Executive Summary

Premier Motors Limited - a subsidiary and a project of PREMIER GROUP OF COMPANIES intends to set up an automotive plant in Balochistan, in collaboration with a German Company Volkswagen. This new state-of-the-art Automotive Manufacturing Complex will have production capacity to build up to 30,000 units per year with the Amarok and Transporter T-6

The EIA has been prepared to conform with the requirements of the Balochistan Environmental Protection Act 2012, the Pakistan Initial Environmental Examination & Environmental Impact Assessment Review Regulations 2000 and the Guidelines for the Preparation and Review of Environmental Reports, 1997.

Premier Motors Limited has involved SGS Pakistan (Private) Limited to undertake the required assessment. This report presents the EIA process and its findings, project impacts and mitigation measures to be implemented during the execution of the proposed activities.

Assessment Methodology

This study has been conducted using standard environmental assessment methodology, in accordance with national and international environmental guidelines. The study evaluates the proposed project according to the environmental assessment requirements of the Pakistan Initial Environmental Examination and Environmental Impact Assessment Review Regulations 2000. Moreover, international guideline and treaties were also consulted.

Project Location

The proposed automotive manufacturing complex covered area is 120 acres and situated ~ 600m in northeast of Goth Abbas (Haji Shah Baig), Mouza Kund, U.C Gadani, Sub District (Tehsil) Gadani, District Lasbela, Balochistan. The proposed project site is situated at ~16km in southwest of Hub Chawki and can be accessed through Hub Chawki-Arabian Sea Road from main Hub City. Another access route is situated in southwest of project area which connects to Goth Mubarak Road and onwards to Karachi.

Proposed Project Activities

The proposed project will entail the following activities:

- Construction and commissioning of the proposed project infrastructure
- Relevant off- site activities
- Operation of the installed facility.

Purpose and Scope of the Study

The purpose of this EIA is to evaluate the activities associated with the proposed project according to the Pakistan Initial Environmental Examination and Environmental Impact Assessment Review Regulations 2000 and international environmental guidelines. **Chapter 2** outlines the applicable statutory environmental requirements and guidelines.

The specific objectives of this EIA are to:

- Assess the existing conditions in the project area and develop a baseline of its current environmental and socioeconomic conditions;
- Assess the proposed activities of the project to identify their potential impact, evaluate these effects, and determine their significance;
- Propose appropriate mitigation and monitoring measures that can be incorporated into the project's design to remove or reduce negative impact as far as possible, and to control and monitor any residual impact (i.e. the effects that remain after mitigation measures are implemented);

Environmental and Socio-Economical Baseline Studies

The project area is defined as 'the areas where the project related activities to be carried, include the proposed project site and surroundings and the areas that can interact with various aspects of the project. The proposed project site with its surrounding area is defined as Project Study Area for baseline development.

The environmental impact of any activity or process is assessed on the basis of a deviation from the baseline or normal situation. Following are the main components of the baseline:

- Physical Environment
- Biological Environment

- Socioeconomic Environment

The baseline data on above components were collected through desk-top surveys, literature review; field surveys; existing information sources and data purchase. Meetings and data gathering from various organizations including, but not limited to:

- Environmental Protection Agency Hub, Balochistan
- Wildlife Department Hub & Lasbela, Balochistan
- Forest Department Hub & Lasbela, Balochistan
- Lasbela University Uthal, Balochistan
- Health Department District Lasbela, Balochistan
- Non-Governmental Organization (NGO)
- Local Communities

Description of the Environment

Topography

The landscape of the district is predominantly a vast sandy plain regularly interrupted by hilly areas. Lasbela lies on the southern coast of the Arabian Sea and the coastal belt is characterized by many bays and creeks with shallow water. Many small towns and hamlets (mostly fishermen settlement) are the main features of the district. The district Lasbela is situated between 24°-54' to 26°-37' north latitude and 64°-02' to 67°-28'. The project area may be classified as gently plain low relief area, having elevation varies from 30 feet (9.144m) to 45 feet (13.716m) from the mean sea levels.

Water Resources

The nearest fresh surface water resource is Hub river situated at around ~02km in east of project area which has a very nominal flow and is dry for most parts of the year. The canals originated from Hub river are also dried and no fresh water available in the ~05km vicinity of project area. Major surface fresh water source is Hub dam approximately 60 km away from the proposed project site. Hub river delta is infested with sea water due to virtually no flow of water from upstream.

A certain amount of water filters into the ground because of seepage from the canals and rainwater that has collected on the surface. This water drains downwards below the root

zone and finally reaches a level at which every available crevice in the earth is filled with water. This area is known as the zone of saturation and the water found here is referred to as groundwater. The community does not prefer groundwater because of its salinity and usually ground water depth is 80 to 200 feet.

The sources of aquifer recharge are:

- Rainwater percolation.
- The Hub River, which is the primary source of recharge in the area
- Seepage & Leaching of irrigation water from canals

The project area predominantly barren. This part of desert area, owing to low rainfalls, high runoff potential and high evaporation rates has limited supply of fresh groundwater. Moreover, the ground water is highly saline due to its existence in proximity of Arabian sea. The ground water is only used for certain domestic purposes other than drinking. Drinking water in the project area is supplied through water tankers. This fresh water is supplied from Hub dam fresh water source. In the desert the thin fresh water lenses and perched fresh water aquifers are also a source of water supply. Precipitation being low in the area does not significantly affect the water table. It only benefits the desert dwellers, where rainwater on a limited scale temporarily fills the Tars or Tals and recharges the dug wells, only to sustain their demands for a limited period of time. Water is extracted through pumps or dug wells (open wells excavated in low lying depressions).

The only source of water for livestock is derived from dugout/natural ponds, in which the water is stored during monsoon season.

Climate

The climate of the district Lasbela is dry and temperate in most parts and humid in the coastal areas. Except for the peak summer months, which are very hot, there is not much variation in climate in the remaining months of the year. The daylight hours are long and solar radiation is very high, indicating strong potential for generation of solar energy.

The summer from March to September is very hot. The winter from mid-November to end of January is sufficiently cold. The spring commences from early February and continues till mid of March. When the temperature starts raising rapidly, the monsoon usually breaks during July and August, when moderate showers of rain are received. The average

temperature ranges from 3oC minimum to 17ºC maximum in January and 24ºC to 49ºC in June.

Rainfall is low and unreliable with periodic droughts for short and long periods, which negatively affects natural resources and livelihoods. Average total annual rainfall is around 30 cm, most of which is during the monsoon season.

Floral Attributes of the Project Area

Biological diversity of project area, specifically flora of the microenvironment is significantly governed by the type of soil i.e. sandy, gravel alkaline and by the amount of moisture available and by metrological conditions; because both soil and weather conditions are regarded direct function of foliage growth and propagation.

Project are mostly cover with *Prosopis Juliflora* and does not lie in any protected forest or demarcated area by forest land.

Faunal Attributes of the Project Area

District has variety of ecosystem including Rocky Mountains, Riverine & rocky forests, and plains including scarce agriculture fields. The stony area covered with small stones and scattred bushes. The most species of Indian Gerbil which are living urder stones and it is omnivores, subsisting mainly on vegetable matter, seeds, young shoots, and berries in winter season. It is nocturnal animal. These are very active and run from one shelter to another.

Mammals *include Mus Musculus, Tatera indica, Vulpes Vulpes, Gerbillus nanus, Canis aureus, Hemiechinus auritus megalotis* and *Hystrix Indca.*

Reptiles *include Trapelus megalonyx, Echis carinatus, Ophisops jerdonii, Laudakia melanura, Bufo stomaticus, Calotes versicolor & Platyceps rhodorachis.*

Birds *include Galerida Cristata, Alauda Gulgula, Melanocory Calandra, Lanius Excubitor, Prinia inornata &*

Socioeconomic Environment

A detailed socioeconomic survey was carried out in and around the project area. The purpose of the survey was to enumerate, evaluate and assess the existing social, cultural and economic conditions and to determine the communities' requirements.

A team comprising environmental assessment specialist, sociologist, environmental scientist and gender specialist carried out the study of socio economic and cultural environment of the project area. The approach and methodology during data collection was a combination of qualitative and quantitative data gathering techniques. The data collection addresses the primary requirements of an Environmental Impact Assessment (EIA), incorporating the Pakistan Environmental Assessment Procedures 1997. A participatory rural assessment was combined with the extensive qualitative data collection of socio-economic and cultural data through short structured questionnaires and focus group interviews with communities and key male informants in the project area. The relevant and accurate information was obtained through professionally competent surveyors. The required information collected efficiently in terms of time and area covered by rapid cycles of interaction with team members and communities. The specific tools used for collection of data include i.e. direct observation, short questionnaire, focus groups and semi-structured interviews.

Focused group discussions revealed a high satisfaction for the proposed project of Premier Motors Limited. The communties member also hoped that the new project activities will provide jobs for local community and Premier Group will also provide health and eduction facilities as welfare work in the area.

Potential Project Impact and Mitigation

Construction Activities Impacts and Mitigation Measures

The potential impacts associated with the proposed project construction and operation activities included: soil erosion due to earthwork, vehicle movement; minimal soil contamination; increase in water consumption, air pollution from vehicle, generator exhausts and fuel combustion, waste generation, noise and disturbance; loss of vegetation and habitat; increased pressure on the wildlife of the area.

The physical scarring caused by clearing and levelling during proposed project construction activities could lead to alteration of soil quality by removal of topsoil, loss of plant cover and limited soil erosion induced by disturbance to native soil.

Loss of topsoil may only take place at a few locations during construction/installation activities. However, in view of the limited area covered by proposed project, this impact is expected to be of low significant. The spillage and leakage of fuels, oils, and other

chemicals may lead to soil contamination. Possible contaminant sources include fuel, lubricant oil, storage areas and all project vehicles. A spill prevention plan will be developed and implemented.

The major surface water resource available near the proposed project area is Hub River which is situated at ~ 02km away in east of project site.

Ground water is the source of water in the project area. Different sources of ground water in the district including tube wells, wells and hand pumps. In the project area, ground water depth varies from 80 to 200 ft.

Water will be required during construction activities. Water will be procured from ground water resources. Water conservation practices will be utilized to reduce the overall water consumption during proposed project activities.

In the project area, a major ambient air pollution source is the vehicular traffic causes smoke and dust emissions whose effect is localised. The main pollutants are particulate matter, carbon monoxide, sulphur dioxide, and nitrogen oxides (depends on type of fuel used). These emissions generally may affect the air quality in the vicinity of the proposed project area.

Air emissions from proposed project-related activities are likely to include:

- Dust emissions produced during construction activities;
- Combustion products (nitrogen oxides, sulfur dioxide, particulate matter, carbon monoxide, and volatile organic compounds) from diesel generators;
- Combustion products from vehicles used for project-related activities;

The sources of emissions during proposed project construction will not be significantly enough to alter the ambient air quality. The emissions will disperse quickly with the prevalent wind currents. All generators, vehicles, equipment and machinery will be properly maintained during the operation to minimize emissions.

Potential sources of noise pollution during project construction process are mainly all kinds of construction machinery, excavators, main power saws, generators, construction equipment, and vehicles during the project activities. Generally different types of vehicles

like, 4x4 DD, cranes, lifter, loader, cars, mobile welding plants etc will use during the various project activities.

The potential noise related issues during construction is the disturbance to workers and the surrounding communities of proposed project facility due to construction machinery operation on the proposed site.

There is no continuous major source of noise in the communities. Intermittent sources of noise include road traffic. Increased noise levels during construction activities can be a source of nuisance for locals and a source of disturbance to wildlife.

Proposed construction activities will generate different types of waste. This includes domestic garbage, packaging waste, paper waste, glass, metals, concrete waste, oil waste, spilled chemicals and oil, kitchen waste, medical waste effluent i.e. grey water and black water etc.

Proponent will implement a thorough waste management plan to ensure that any impact resulting from waste generation and management shall be minimal. The recyclable waste will be sold to waste contractors, as per waste management plan. No hazardous chemical will be uncontrollably discharged into the environment. Records of all waste generated during the project activity period will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a waste tracking register. Audits of the waste disposal contractors and waste disposal facilities will be undertaken on a regular basis to ensure the implementation of waste handling and disposal procedures.

The vegetation of the project area and in its surroundings, mainly comprise of *Prosopis Juliflora*. During construction and road travel dust will be generated which may accumulate on the road side vegetation and cause possibly hinder the vegetation growth and respiration. The effect of vegetation clearing and loss of habitat is less significant for development activities as the proposed location is already a barren land and mostly comprise of *Prosopis Juliflora*.

During the construction/installation activities there will be possible disturbance to wildlife due to disturbance and loss of habitat, clearing and levelling of construction site. Wildlife may also be disturbed due to sensory disturbance from earthwork, construction; movement of vehicles and crew personnel. This can possibly result in changes in distribution and

abundance. To minimize the impact, vegetation loss will be kept to an absolute minimum. No-hunting and no-trapping policy will be strictly enforced, unless human life is under threat.

Operational Activities Impacts and Mitigation Measures

The operation activities of automotive industry can be divided into different processes such as Press Shop, Body Shop, Paint Shop, Assembly Shop and Performance Inspection & Test tracks etc. Other activities are discharges of liquid wastes/waste wasters/effluents, emissions of gaseous wastes from generator stack, security, water demand and use, management of solid wastes and office and administrative activities.

The air emissions are main environmental concerns pertaining to automotive industry which discharges from different processes such as production processes in body shop with welding operations result in emission of fumes and gases from welding and cutting operation; airborne metal particles; abrasive particles from grinding and polishing discs; burned oil fumes; fumes from heated sealant, and heat;

Production processes in paint shop results in emission of Volatile Organic Compounds (VOCs) emissions; fugitive emissions; burned oil fumes; fumes from heated sealant, and heat;

Pollutants are emitted from multiple sources from a vehicle manufacturing in the assemble. These emissions are even more concentrated when the vehicle is first started.

Process related measures allowing the emission rates reduction with the recommended mitigation measures.

The principal sources of noise in automotive facilities include the multiple processes in press shop, body shop, welding area, paint shop and assembly shop.

Proposed activities could affect the area's water resources in two ways:

- Reduction from overuse, and
- Contamination

There is no prominent surface water resource is available within the proposed project area except Hub River situated ~ 02km in east of proposed project.

Ground water is another source of water in the project area. Different sources of ground water in the district including tube wells and dug wells. In the project area, ground water depth varies from 80ft to 200ft.

Due to the particularity of groundwater resources, the project need to be considered sufficient water saving measures in the design, avoid over-exploitation of groundwater resource, environmental impact on the local water resources.

The water feature of this project would be water resource reutilization to minimize the impact on fresh water consumption level.

The total waste water generation is expected to be 75,000 gallons/day during normal continuous operation and the maximum continuous drainage would be 250,000 gallons/day. The main process source of waste water generated in automobile industry from paint shop. The automobile industry's wastewater not only contains high levels of suspended and total solids such as oil, grease, dyestuff, chromium, phosphate in washing products, and coloring at various stages of manufacturing but also, a significant amount of dissolved organics, resulting in high BOD & COD loads.

The waste coming out from the paint shop includes different types of wastes. The phosphate unit has phosphate and deionized water rinse, while the Electro-Deposition Process (ELPO) unit waste includes the ultra-filtration water, De-ionized water and heavy metals.

A modern effluent treatment facility will be provided to treat all these streams. The treatment plant will be based on technology Moving Bed Biofilm Reactor (MBBR) which is a highly effective treatment process consist of combination of conventional activated sludge process and biofilm media. The design scale of effluent treatment facilities is 250,000 gallons/day, and it uses "oil separation, flotation, A/O biochemical reaction, high density coagulation sedimentation and multimedia-filtration" process.

During the Handling of chemicals there are chances of leaks, spills and accidental mixing of incompatible chemicals. The potential for accidental spills and leaks is highest at the point of transfer of thinners from bulk drum storage to process equipment.

Solid Waste may arise from several sources during assembly and the majority of wastes by volume result from packaging-reusable or disposal. Reusable packaging covers metal

racks, bins and containers and disposable packaging covers wood pallets, cardboard, plastic, polystyrene and polythene film.

The proposed project would be expected to result in an increase of several dispatch trucks per week in and out of the property after the new plant is fully operation. This additional truck traffic would constitute the percentage of the current truck traffic on the existing Hub Chaki–Arabian sea road. The additional trucks trips to the site would be easily accommodated within the existing roadway and intersection network.

The proposed project would generate a minor long-term increase in privately-owned vehicle traffic. The proposed plant would operate 24 hours a day, 7 days a week. The new workers would be split among operation shifts, thus reducing the impact on traffic. The additional vehicle traffic would be less than 05 percent of the current annual daily traffic count on the road, and therefore would generate a negligible impact. Proposed project is situated in open barren area, this small increase in vehicle traffic would have only a minor impact to the surrounding community.

Vehicle assembly plants can be noisy work places due to the high level of use of machinery. Transport of products by road may also generate noise. Those at risk include machine operators and those working nearby, e.g. maintenance staff, cleaners, forklift truck drivers and shop floor supervisors.

Noise may reach levels that are hazardous to health, leading to symptoms associated with permanent deafness. Noise, particularly during unsocial hours, may cause annoyance or disruption to local communities.

Hand-arm vibration syndrome from the prolonged use of vibrating tools and machinery causes effects on the body blood circulation known as ‘vibration white finger’ (VWF). Other damage may be caused to the nerves and muscles of the fingers and hands causing numbness and tingling, reduced grip strength and sensitivity. Pain and stiffness in the hands, and joints of the wrists, elbows and shoulders are other possible symptoms.

The project operational phase will also generate new jobs. Most of these vacancies will be filled by locals.

Similarly, the construction and operation of the project will create far greater number of indirect income resources for example income resource for transporters for the transportation of the materials, procurement of goods from local market etc.

Overall the proposed project will have a very positive impact on the employment opportunities in the project area.

Premier Group as a responsible corporate citizen has number of ongoing community development programs. The community developments schemes will remain continue in this new proposed project.

A summary of potential impacts and proposed mitigation measures during construction is provided in **Table ES-1.**

A summary of potential impacts and proposed mitigation measures during operation is provided in **Table ES-2.**

Environmental Management Plan (EMP)

For effective implementation and management of mitigation measures, an Environmental Management Plan has been prepared. The EMP provides a delivery mechanism to address potential impacts of project activities, to enhance project benefits and to introduce standards of good practice in all project activities. The EMP has been prepared with the objective of:

- Defining legislative requirements, guidelines and best industry practices that apply to the project;
- Defining mitigation/ monitoring plan required for avoiding or minimizing potential impacts assessed by the EIA;
- Defining roles and responsibilities of the project proponent and the contractor;
- Defining requirements for environmental monitoring and reporting;
- Defining the mechanism with which training will be provided to the project personnel.

Environmental sensitivities and impacts, as well as the associated mitigation plan have been addressed in the EMP. Premier Motors Limited will ensure that the project staff will be adequately trained in HSE sensitivities and operational management procedures, so that all levels of staff effectively contribute to impact prevention and mitigation at all times.

An Environmental Management Plan (EMP), providing:

- A systematic approach to ensure that mitigation strategies prepared in this EIA are implemented during project activities.
- An appropriate monitoring plan is device to ensuring strict adherence to the environmental mitigation and control measures.
- A training program is device to providing awareness training on all potential environmental issues of the project to all personnel at site.
- A waste management plan, identifying the most suitable waste disposal and pollution control options throughout the project lifecycle.

Table ES-1: Summary of Impacts and Mitigation Measures during Construction Phase

No	*Impact*		*Mitigation Measures*	*Responsibility*		*Action/Monitoring Parameter/Monitoring Method*	*Timing*
				Execution	*Monitoring*		
1.	Soil Erosion & Contamination	1.1	Unnecessary clearing outside work areas will be avoided.	CC	PP	Monitor land clearing activities.	During construction phase
		1.2	Unnecessary clearing of vegetation will be strictly prohibited.	CC	PP	Check the sites and routes selected for camp site and monitor land clearing activities.	Before land clearing
		1.3	Vehicle speeds will be regulated and monitored to avoid excessive dust emissions.	CC	PP	Set speed limits, train drivers and check Compliance.	During construction phase
		1.4	Periodic trainings will be provided to drivers on mitigation measures related to off-road travel and speeds limits.	CC	PP	Check training records.	During construction phase
		1.5	Off-road travel should be avoided and observance of this should be monitored during the activities.	CC	PP	Approve access track and monitor off road travel.	During construction phase
		1.6	Incident record of all moderate and major spills will be maintained. The record will include the location of spill; estimated quantity; spill material; restoration measures; photographs; description of any damage to vegetation, water resource, and corrective measures taken.	CC	PP	Check compliance	During construction phase.
		1.7	Fuel tanks will be daily checked for leaks and all such leaked will be plugged immediately.	CC	PP	Daily checking of fuel tanks for leakages	During construction phase.
		1.8	All fuel and oil storage areas will have a secondary containment to prevent soil	CC	PP	Ensure provision of Secondary containment	During camp set-up and

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
			contamination in case of leaks or spills.				construction activity.
		1.9	Photographs will be taken before any activity to record the conditions of site at locations that are likely to undergo soil erosion. Similar photographs will be taken after restoration, where applicable.	CC	PP	Take photographs before and after construction activity to monitor any change and soil conditions.	During all project activities
		1.10	A Waste Management plan will be followed to deal with spills.	CC	PP	Development of Waste Management plan and its implementation	During construction phase
2.	Water Resources	2.1	Water consumption for each project activity will be recorded.	CC	PP	Check water consumption records	During construction phase
		2.2	Develop and follow a project-specific oil spill contingency plan.	CC	PP	Check compliance	During construction phase
		2.3	Water conservation programme will be followed to prevent wastage of water.	CC	PP	Development of water management plan and its implementation, check compliance	Construction planning and design phase / during construction phase
		2.4	Follow good housekeeping practices with all machinery that may potentially discharge into or come in contact with the surface water.	CC	PP	Check housekeeping practices	During construction phase
		2.5	Fuels and lubricants will be stored in areas with impervious floors that can contain spills.	CC	PP	Check compliance	During construction phase
		2.6	All areas containing potentially hazardous materials will be isolated and contained.	CC	PP	Check compliance	During construction phase
3	Air Pollution, GHG Emissions	3.1	All equipment, generators, and vehicles used during the project will be properly tuned and maintained in good working	CC	PP	Check compliance	During all project activities

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
			condition in order to minimize exhaust emissions.				
		3.2	Imposing speed limits and encouraging more efficient journey management will reduce the dust emissions produced by vehicular traffic.	CC	PP	Visually check dust emissions	During Construction phase
		3.3	All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.	CC	PP	Visually check smoke and emissions	During all project activities
4.	Construction Noise	4.1	All on-site personnel will use required personal protective equipment (PPE) in high noise areas that will be clearly marked.	CC	PP	Check compliance	During construction and fabrication of plant activities
		4.2	Equipment noise will be reduced at source by proper design, maintenance and repair of construction machinery and equipment.	CC	PP	Monitor compliance and periodic noise monitoring	Prior to start and during construction phase
		4.3	Noise-abating devices will be used wherever needed and practicable.	CC	PP	Monitor compliance and periodic noise monitoring	Planning and design of construction phase
		4.4	Movement of all project vehicles and personnel will be restricted within work areas.	CC	PP	Check compliance	During all project activities
5.	Waste Management	5.1	Waste management plan will be followed while key elements of the waste management system will be the following in below sections:	CC	PP	Check compliance	During construction phase
		5.2	Separate bins will be placed for different type of wastes - plastic, paper, metal, glass, wood, and cotton.	CC	PP	Monitor compliance	During construction phase

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
		5.3	Recyclable material will be separated at source. The recyclable waste will be sold to waste contractors for recycling.	CC	PP	Recycle waste disposal records	During construction phase
		5.4	No waste will be dumped at any location outside the plant boundary.	CC	PP	Monitor compliance	During construction phase
		5.5	On-site audits of the waste management will be undertaken on a regular basis during the period of project activity.	CC	PP	Onsite waste management audit	During construction phase
		5.6	All waste will be collected and segregated for reuse, recycling or disposal.	CC	PP	Check compliance	During construction phase
		5.7	Segregate hazardous wastes and remove to a suitable, licensed facility depending on the best environmental option.	CC	PP	Check compliance	During construction phase
		5.8	Records of all waste generated during the project activity period will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a waste tracking register.	CC	PP	Check record/ waste tracking register	During construction phase
		5.9	All non-hazardous waste material that cannot be recycled or reused will be disposed-off as per waste management plan.	CC	PP	Check compliance	During construction phase
		5.10	Depending on the nature and quantity of the hazardous waste, it will be disposed of by licensed hazardous waste contractors as per the waste management plan.	CC	PP	Check compliance	During construction phase
		5.11	Recyclable waste will be disposed of via approved waste contractors	CC	PP	Check compliance	During construction phase
		5.12	Audits of the waste disposal contractors	PP		Waste contractor audit	During construction

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
			and waste disposal facilities will be undertaken on a regular basis to check that procedures are being followed.				phase
		5.13	Training will be provided to personnel for identification, segregation, and management of waste.	CC	PP	Conduct periodic training and maintain training record.	During construction phase
		5.14	An emergency response plan will be developed for the hazardous waste (and substances).	CC	PP	Develop and implement emergency response plan.	During construction phase
		5.15	All containers of hazardous waste will be labeled.	CC	PP	Check compliance	During construction phase
6.	Vehicle Movement	6.1	Journey management plan will be developed in accordance with Premier Motors Limited procedures.	CC	PP	Check compliance	During construction phase
		6.2	Existing tracks will be used wherever possible.	CC	PP	Check compliance	During construction phase
		6.3	Project vehicles will follow the speed limits prescribed by Premier Motors Limited. Drivers will receive specific training on this requirement.	CC	PP	Check compliance	During construction phase
7.	Disturbance to Wildlife	7.1	Vegetation loss will be kept to an absolute minimum. Large bushes and areas of dense vegetation will be avoided. Trees will not be felled.	CC	PP	Check compliance	During construction phase
		7.2	Ensure that a 'no-hunting, no-trapping, no-harassing. Wildlife policy will be strictly observed, unless threatening to human life.	CC	PP	Check compliance	During construction phase
		7.3	Food wastes will not be disposed of in the open.	CC	PP	Check compliance	During construction phase

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
		7.4	Wildlife protection rules will be included in trainings.	CC	PP	Monitor compliance	During construction phase
		7.5	Incident record of all damage or harm to the wildlife will be maintained.	CC	PP	The record will include the identification of species; location of incident; harm; person(s) responsible; explanation of violation; measures taken to prevent reoccurrence of the event; photographs, if available.	During construction phase
		7.6	Movement of all project personnel will be restricted to work areas;	CC	PP	Check compliance	During construction phase
8.	Clearing of natural Vegetation	8.1	Camp sites will be located in existing clearing. Vegetation clearing from these sites will be kept to a minimum.	CC	PP	Check compliance	During construction phase
		8.2	When developing new tracks, routes that minimize vegetation loss will be chose and unnecessary damage to vegetation will be avoided;	CC	PP	Check compliance	During construction phase
9.	Socioeconomic / Local community	9.1	All community grievances will be recorded and maintained in a Community Complaint's Register. In addition to this close liaison will be maintained between the community and the site representatives of Premier Motors Limited throughout the project activities	CC	PP	Check the provision of complaint register and its access for communities	During construction phase
		9.2	Maximum number of unskilled and semi-skilled jobs will be reserved for the local	CC	PP	Check compliance	During construction phase

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
			communities.				
		9.3	Communities will be informed about the project activities and possible disturbance in advance.	CC	PP	Check compliance	During construction phase
		9.4	Awareness and cultural inductions to educate the contractor workforce on the requirement of minimizing social interaction with local communities;	CC	PP	Check compliance	During construction phase
		9.5	Unnecessary interaction of local population with the non-local project staff will be avoided.	CC	PP	Check compliance	During construction phase
		9.6	Discharging firearms will be explicitly prohibited.	CC	PP	Check compliance	During construction phase
		9.7	A local labor selection criterion will be developed which will be based primarily on merit and on equitable job distribution among the locals.	CC	PP	Monitor adherence with the criteria	Construction planning and design phase / During construction phase

CC = Construction/Commissioning Contractor, **PP** = Project Proponent

Table ES-1: Summary of Impacts and Mitigation Measures during Operation Phase

No	*Impact*		*Mitigation Measures*	*Responsibility*	*Monitoring*
1.	Air Emissions (Body Shop with Welding and Joining Operations)	1.1	Avoid or reduce oil film on the welded surfaces;	PP	Monitor compliance
		1.2	Reduce expulsion with spot welding;	PP	Monitor compliance
		1.3	Avoid short-time conditions with spot welding, changing over to medium-time conditions;	PP	Monitor compliance
		1.4	Place containers with welded small parts in the totally enclosed cabinets connected to exhaust system to avoid residual welding smoke release into the building;	PP	Monitor compliance
		1.5	General ventilation is needed to dilute pollutants not captured by the local and to dilute fumes generated after welding;	PP	Monitor compliance
		1.6	General ventilation systems make-up air to replace air extracted by local and general exhaust systems;	PP	Monitor compliance
	Air Emissions (Paint Shop)	1.7	The exhaust air from the spray booth will have to be treated by a venturi wet scrubber or any other paint overspray collector in order to collect paint overspray particles;	PP	Monitor compliance
		1.8	Ventilation; Ventilation systems in paint shops typically consist of general supply and exhaust systems. The major objectives of the paint shop building ventilation system are; Provide required make-up air for process; Maintain proper building pressurization; Maintain comfort for occupants in the building; Provide adequate ventilation air for the occupants	PP	Monitor compliance
		1.9	Coordination between process and building ventilation; Make-up air and exhaust air to and from paint booths and oven are provided by process ventilation systems. HVAC systems design of the “clean room” areas and spot cooling of workers on inspection, repair and preparation decks is also responsibility of process engineers;	PP	Monitor compliance
		1.11	General Supply Systems; General ventilation supplies 100% outdoor air. The supply air flow rate should exceed the make-up air flow for booths and ovens and be sufficient for building pressure management. General ventilation supply units are located on the	PP	Monitor compliance

No	Impact		Mitigation Measures	Responsibility	Monitoring
			building roof or in a penthouse. General exhaust systems typically include roof mounted exhaust fans located in the oven area, laydown area and phosphate area as required to maintain the building air balance;		
		1.12	Air distribution; Air should be supplied into the lower zone (at the floor level where possible) with air diffusers installed evenly along the shop. However, in nearly all paint shops some dumping of air is unavoidable, due to process restrictions;	PP	Monitor compliance
	Air Emissions (Assembly Area)	1.13	Ventilation systems in the assembly shop typically consist of local exhaust ventilation systems to control vehicle exhaust and contaminant emissions from contaminant producing areas. General ventilation is needed to dilute the contaminants released into the building that are not captured by local ventilation systems. General ventilation systems supply make up air to replace air extracted by local exhaust systems;	PP	Monitor compliance
		1.14	Windshield Gluing Station Ventilation The vapors produced by this manual process are captured by back draft or downdraft hood;	PP	Monitor compliance
		1.15	Door Seals and Trim Stations Ventilation Local exhaust system use to capture the vapors produced by this manual process is similar to those used at the windshield gluing station: back draft or downdraft hood;	PP	Monitor compliance
		1.16	Chassis Alignment Inspection Station Ventilation – The ventilation technique to properly ventilate the exhaust gases and evaporation of fluids off the vehicle is typically handled with a combination system. The pit where plant personnel are located is customarily ventilated through an in-floor method. Vehicle exhaust gases should be removed through the means of a source capture hose extraction system;	PP	Monitor compliance
		1.17	Paint Rework Station Ventilation – The ventilation technique to properly ventilate this area is through the use of a combination system consisting of horizontal flow push pull hoods along with a fume extractor arm with built in work lighting;	PP	Monitor compliance

No	Impact		Mitigation Measures	Responsibility	Monitoring
2.	Noise	2.1	Noise control devices will be used such as noise barriers and deflectors for high noise impact activities.	PP	Periodic noise level surveys at various sources and locations
		2.2	The noise producing equipment will be placed inside the acoustic enclosures to reduce noise at source.	PP	
		2.3	All equipment with potential of noise generation will be well maintained.	PP	
		2.4	PPEs will be provided to persons working in close proximity. Before the start of the operations conduct a noise survey of the equipment and prepare a noise control plan.	PP	
3.	Water Resources	3.1	Identification, regular measurement, and recording of principal flows within a facility	PP	
		3.2	Water measurement (metering) should emphasize areas of greatest water use. Based on review of metering data, 'unaccounted' use–indicating major leaks at industrial facilities–could be identified	PP	Monitor compliance
		3.3	A water management plan will be developed. The plan will also include strategies to minimize water use (and therefore volume of discharge) and maintain reserves; The essential elements of a water monitoring and management program involve	PP	Monitor compliance
		3.4	Follow good housekeeping practices with all machinery that may potentially discharge wastewater;	PP	Monitor compliance
		3.5	No untreated effluents will be released to the environment;	PP	Monitor compliance
4.	Waste Water	4.1	Effluent Treatment Plant: A modern effluent treatment facility will be provided to treat all these streams. The treatment plant will be based on technology Moving Bed Biofilm Reactor (MBBR) which is a highly effective treatment process consist of combination of conventional activated sludge process and biofilm media. The design scale of effluent treatment facilities is 250,000 gallons/day, and it uses "oil separation, flotation, A/O biochemical reaction, high density coagulation sedimentation and multimedia-filtration" process. The treated water will be reused into the circulating the water plant. • Ensure no wastewater run out from the paint booth while washing and other	PP	Provision of wastewater treatment plant at design phase/Monitor

No	Impact		Mitigation Measures	Responsibility	Monitoring
			activities takes place, waste stream should be connected to wastewater treatment plant. • Sludge should be separated from the wastewater and consider hazardous waste and disposed of environmental friendly with the third-party certification. • In the basic design and detailed design stage, the selection of measurement, regulation and control instrumentation valves will give full consideration to the use of water-saving instruments and related valves;		compliance Monitor compliance / wastewater sampling and testing records
		4.2	Wastewater Recycling: According to the principle of clean & waste water diversion and wastewater recycling, the wastewater of the automotive industrial wastewater will be able to be recycled in the process. After stripping, the most water is used into the process facilities, and the rest flows into the effluent treatment plant. The wastewater in the whole automotive industry is treated in the effluent treatment plant to achieve the standard for reuse in gardening and other purposes. The treated water is as a part of makeup water, and reuse into the circulating water plant.	PP	
5.	Soil Contamination	5.1	Material should never be poured directly from drums to small containers;	PP	Monitor compliance
		5.2	Secondary containment should be provided in order to prevent the soil contamination;	PP	
		5.3	Spigots or pumps should always be used to transfer waste materials to storage containers;	PP	
		5.4	Do not handle chemicals with bare hands, no matter how harmless you may think they are;	PP	
		5.5	After handling chemicals, hands should be washed prior to eating or drinking;	PP	
		5.6	Chemicals that can produce fumes, dusts should always be handled in a well-ventilated area. Use of containment devices such as fume hoods, and gas cabinets is particularly advisable. A fume hood, glove box or other appropriate exhaust ventilation is necessary when handling particularly hazardous substances;	PP	
		5.7	Do not eat and drink while working with chemicals;	PP	
		5.8	Do not light a match or smoke tobacco close to inflammable chemicals;	PP	

No	Impact		Mitigation Measures	Responsibility	Monitoring
		5.9	Use appropriate devises like funnels or spatulas when transferring chemicals from one container to another or when mixing chemicals;	PP	
		5.10	Keep work surfaces and containers clean;	PP	
		5.11	Use corrosion-resistant tools and equipment;	PP	
6.	Solid Waste Management	6.1	Return packaging of hazardous and non-hazardous materials (wherever possible), such as empty drums, to supplier for reuse;	PP	Monitor compliance
		6.2	Recycle packaging wherever possible;	PP	
		6.3	Develop and implement a waste management plan covering all aspects of waste treatment on site. Wherever possible, priority should be given to reduction of waste generated, and recovery and re-use of raw materials;	PP	
		6.4	Separate bins will be placed for different types of wastes-plastic, paper, metal, glass, wood and cotton;	PP	
		6.5	Recyclable material will be separated at source. The recyclable waste will be sold to waste contractors for recycling;	PP	
		6.6	No waste will be dumped at any location outside the project boundary;	PP	
		6.7	All hazardous waste will be separated from other wastes. Hazardous wastes will be stored in designated areas with restricted access and proper marking. Hazardous wastes will be disposed-off through approved waste contractors;	PP	
		6.8	Surplus materials including partially filled chemical and paint containers will be returned to suppliers. Inert wastes will be disposed-off onsite as filled material;	PP	
		6.9	Records of all waste generated will be maintained. Quantities of wastes disposed, recycled, or reused will be logged on a waste tracking register;	PP	
		6.10	Training will be provided to personal for identification, segregation and management of waste;	PP	
7.	Transportation	7.1	Vehicle road worthiness certification and vehicle fitness certificate will be ensured;	PP	Monitor compliance

No	Impact		Mitigation Measures	Responsibility	Monitoring
	and Traffic	7.2	Traffic management plan will be developed;	PP	
		7.3	Transportation safety plan will be established for operations	PP	
8.	Occupational Health & Safety	8.1	Heat stress injuries can be prevented through the implementation of an effective heat stress program	PP	Monitor compliance
		8.2	An Occupational Health and Safety Plan that should include specific job-related risk (maintenance of air quality levels of contaminant, dust vapors and gases for workers in close proximity to paint storage tanks and recommend limits). In addition, the Management Plan should provide a means of training workers in the use of the available information on substances from Materials Safety Data Sheet.	PP	
		8.3	Protection measures should include worker training, work permit systems, use of PPE, and fire alarms.	PP	
		8.4	Protective and preventative measures should be introduced to eliminate or disrupt source-pathway-receptor relationships. This can be achieved by eliminating the hazard, controlling the hazard, minimizing the hazard and providing appropriate personal equipment (PPE).	PP	
		8.5	Train workers in correct use of machinery and safety devices.	PP	
		8.6	Ear plugs and Ear muff will be used in high noise areas.	PP	

PP = Project Proponent

O&M Contractor = Operation & Maintenance Contractor

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Acronyms

APHA	American Public Health Association
BEPA	Balochistan Environmental Protection Agency
BHU	Basic Health Unit
BOD	Biological Oxygen Demand
CBD	Convention on Biological Diversity
CPEC	China Pakistan Economic Corridor
CFC's	Chlorofluorocarbons
COD	Chemical Oxygen Demand
CMS	Conservation of Migratory Species of Wild Animals
CFC's	Chlorofluorocarbons
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
ETP	Effluent Treatment Plant
F& G	Fire and Gas
GHG	Green House Gases
HSE	Health, Safety and Environment
hr	Hour
IUCN	International Union of Conservation for Nature
kg	Kilogram
Km^2	Square Kilometre
m	Meter
mg/kg	Milligram per Kilogram
mg/l	Milligram per Litre
mg/m^3	Milligram per Cubic Meter

MW	Mega Watt
NEP	National Environmental Policy
NEQS	National Environmental Quality Standards
NO_X	Nitrogen Oxides
NCS	National Conservation Strategy
NGO's	Non-Governmental Organizations
OSHA	Occupational Safety and Health Administration of the United States
PEPA	Pakistan Environmental Protection Act 1997
PEPC	Pakistan Environmental Protection Council
PM	Particulate Matter
PPE's	Personal Protective Equipment
ppm	Parts per Million
SOx	Oxides of Sulphur
Sq. Km	Square Kilometer
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
WHO	World Health Organization

1 Introduction

This report presents the findings of an Environmental Impact Assessment (EIA) carried out by SGS Pakistan (Private) Limited for construction and operation of Automotive Manufacturing Plant situated in Tehsil Gadani, District Lasbela, Province Balochistan.

The EIA has been prepared to conform with the requirements of the Balochistan Environmental Protection Act 2012, the Pakistan Initial Environmental Examination & Environmental Impact Assessment Review Regulations 2000 and the Guidelines for the Preparation and Review of Environmental Reports, 1997.

1.1 Project Title and Project Proponents

1.1.1 Project Title

The proposed project to which this Environmental Impact Assessment study relates is entitled as *"EIA for the Construction and Operation of Automotive Plant"*. The proposed automotive manufacturing complex covered area is 120 acres and situated ~600m in northeast of Goth Abbas (Haji Shah Baig), Mouza Kund, U.C Gadani, Sub District (Tehsil) Gadani, District Lasbela, Balochistan. The proposed project site is situated at ~16km in southwest of Hub Chawki and can be accessed through Hub Chawki- Arabian Sea Road from main Hub City and another access route situated in southwest of project area which connects to Goth Mubarak road and onwards to Karachi. The project location is given in **Figure 1.1.**

1.1.2 Project Proponent

Project Proponent	**Premier Motors Limited – Premier Group**
Registered Office	2nd Floor Business Plaza, Mumtaz Hassan Road, 74000 Karachi, Sindh Pakistan
	Tel: +92-21-32456400, +92-21-32429051
	Fax: +92-21-32428777
	www.premier.com.pk
Contact Information	Mr. Ijaz Ahmed
	Site Services Manager
	Tel: 0092-333-2308697
	Email: Ijaz.ahmed@premier.com.pk

Premier Motors Limited - a subsidiary and a project of PREMIER GROUP OF COMPANIES intends to set up an automotive assembly plant in Balochistan, in collaboration with a German Company Volkswagen.

Premier Group is one of the leading veteran to handle multiple projects of small, mid-sized and large customers belonging to various industries, such as telecom, banking, oil & gas and defense in Pakistan.

Premier Group also introduced the first private crude oil refinery at Hub Baluchistan, which today is the largest refinery operational in Pakistan.

Premier

A simplified identity, reflective of a coherent vision toward the future

Premier Group by the name Premier Systems (Pvt.) Ltd. is also the sole importer and authorized dealer of Audi AG in Pakistan since 2006. Audi is a German automobile manufacturer which has been a symbol of quality and performance worldwide. It's one of the most multi-faceted stories ever told in the history of the automobile. The Audi emblem with its four rings identifies as one of Germany's oldest-established automobile manufacturers.

1.2 EIA Consultants

The EIA study was carried out by team of **SGS Pakistan** comprising of Environmentalist, Environmental Engineer, Sociologist, Environmental Chemist and Wildlife Experts with diversified experience on local and international assignments.

EIA Consultant	**SGS Pakistan (Private) Limited**	
Registered Office	H-3/3, Sector 5, Korangi Industrial Area, Karachi- Pakistan	
	Tel: +92-21-32456400, +92-21-32429051	
	www.sgs.com	
Contact Information	Mr. Syed Faseeh	Mr. Irfan Ali
	Senior Manager EHS & Mineral	Senior Executive Officer
	Tel: 0092-300-2015825	Tel: 0092-331-2481590
	Email: syed.faseeh@sgs.com	Email: Irfan.ali@sgs.com

The detail of the project team deputed on this assignment is attached as **Annexure-A.**

1.3 The Project Rationale

Pakistan is experiencing an unstable economic condition. To overcome this fact, Government of Pakistan have initiated different industrial and commercial scenarios for investment. Among these role of Automotive Industry in development of the country has also been proposed as an economic booster industry. By focusing on the need of the country, the proposed project is expected to generate high annual revenue in exports, duties and taxes for Pakistan.

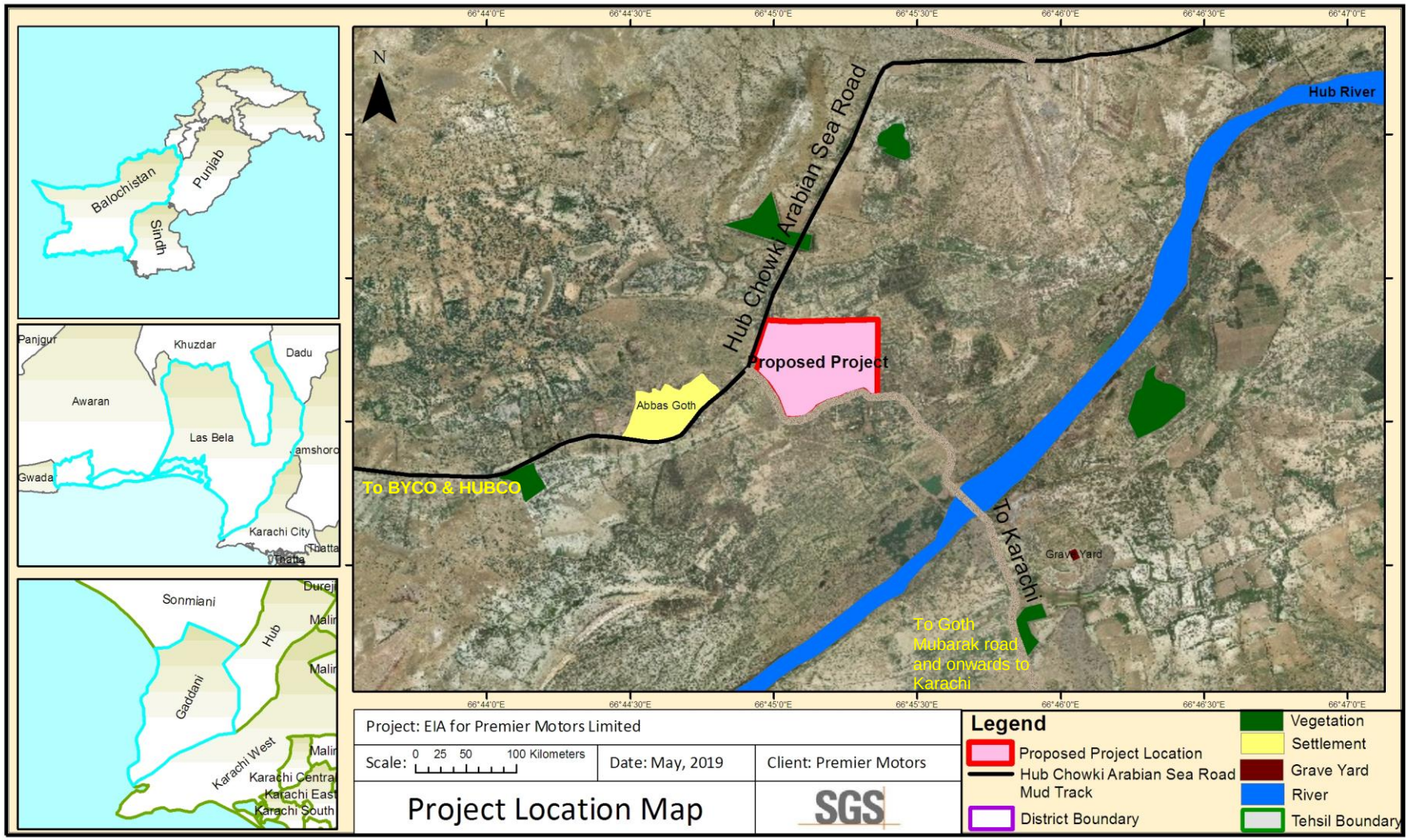
Premier Motors Limited in the first phase, will assemble 28,000 units of T-6 light commercial vehicles (LCVs) and Amarok 4x4 vehicles. The project is expected to generate numerous jobs in direct and indirect ways.

Pakistan's Commercial Wing in Berlin has been engaged with the two companies for two years. Its efforts resulted in the signing of a letter of intent on June 22, 2017, in this regard.

It has become paramount for an increase in private investments in the Pakistan automotive sector to tackle chronic challenge.

The demand of automotive product is expected to rise potentially as country is entering a new era of growth through CPEC development. Government of Pakistan encourages private entities to invest in automotive sector, to fill in the gap of supply & demand.

Figure 1.1: Project Location



1.4 EIA Process

1.4.1 Overview of EIA

EIA is a systematic process to identify, predict and evaluate the environmental impacts of proposed actions and projects. The process is applied prior to major decisions and commitments being made. Wherever appropriate, social, cultural and health effects are considered as an integral part of EIA. Particular attention is given to practical implementation of EIA to prevent and mitigate significant adverse effects of the proposed undertakings.

1.4.2 Objective of EIA

The overall objective of the EIA is as follows:

- Identifying possible environmental impacts;
- Screening of impacts to identify more significant impacts;
- Evaluating those impacts;
- Discussing appropriate mitigating methods;
- Finding out alternatives;

1.4.3 Scope of EIA

This EIA covers the construction and operation of Premier Motors Limited Automotive Plant, located in sub district Gadani, District Lasbela, Province Balochistan. The scope of the EIA includes:

- Construction of the proposed project infrastructure
- Relevant off- site activities
- Operation of the installed facility.

1.4.4 Spatial Scope

Impacts will be assessed within the area of influence of the project defined as:

- Immediate Area of Influence: at immediate foot print of the proposed project locations.

- Direct Area of Influence: within the proposed project site boundary and 5 km radius of surrounding area (defined as study area of environmental and social baseline development).

1.4.5 Temporal Scope

The assessment of impacts in terms of duration is as follows:

- Effects on environmental and socioeconomic receptors and resources are assessed for the entire construction activity.
- Effects on environmental and socioeconomic receptors and resources are assessed for the operation activity.

1.5 EIA Methodology

The approach and methodology for conducting EIA study adopted comprises of following phases:

1.5.1 Scoping

Scoping is designed to ensure the EIA captures all relevant information related to:

- the impacts of the project, in particular focusing on the most important impacts;
- other environmental sensitivities to be addressed at early stage.

The purpose of scoping was to identify:

- the important issues to be considered in an EIA;
- the information necessary for decision-making;
- the significant effects and factors to be studied in detail.

The scoping was followed by data collection describes in subsequent sections.

1.5.2 Data Collection

Following literature reviews and data collection was carried out for EIA:

- A generic description of the proposed project and its related activities was collected from Premier Motors Limited.

- Legislative review of the applicable laws, regulations, guidelines and standards from various organisations and literature search.
- Baseline of the area's environmental and socio-economic settings was collected through field surveys and literature search.

1.5.3 Baseline

The environment impact is measured through a change in the environment, resulting from a designated action or activity. In order to identify such a change, it is essential to have as complete as practicable understanding of the nature of the existing environment, prior to its interaction with the proposed activity. This translates into the need to characterize the existing baseline environmental condition, including establishing prevailing conditions for a range of environmental media, notably water, soil and groundwater, flora and fauna and the human environment.

This was achieved through a detailed review of all secondary resources (i.e. existing documentation and literature); and the undertaking of project specific baseline studies and surveys to collect supplementary data in the following areas:

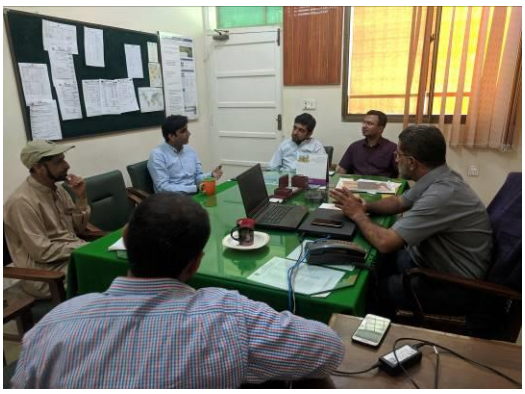
- Geology;
- Flora and fauna;
- Water quality characteristics;
- Soil quality;
- Traffic;
- Air quality;
- Noise conditions;
- Socio-economic conditions;
- Archaeology.

Both the existing secondary sources and literature studies were conducted and integrated into one coherent description of baseline characteristics.

Figure 1.2: EIA Field Activities by SGS Pakistan

	
Preliminary Site Survey	Air Quality Monitoring Station
	
Metrological Parameters Monitoring	Particulate Matter Monitoring
	
Noise Monitoring	Soil Sampling

Figure 1.3: EIA Field Activities by SGS Pakistan

	
Ground Water Sampling	Surface Water Sampling
	
Wildlife Expert Survey	Socio-Economic Survey
	
Primary Stakeholder Consultation Meetings	Secondary Stakeholder Consultation Meetings

1.5.4 Stakeholder Consultation

Communities within the project area were consulted during the fieldwork to record their concerns and suggestions.

1.5.5 Impact Assessment and Mitigation

The information collected in the previous phases was used to assess the potential environmental impacts of the proposed project activities. The impact assessment approach is provided in **Table 1.1.** Detailed methodology is included in **Chapter 6** of the report. Mitigation measures were evaluated to reduce the impacts of project activities on environment. The issues studied during impact assessment include potential impacts on:

- Physical environment of the area
- Biological environment of the area
- Socio-economic environment of the area

Table 1-1: Impact Assessment Approach

Impact Characteristics	*Categories*
Nature of the Impact	**Direct**: The environmental parameter is directly changed by the project. **Indirec**t: The environmental parameter changes as a result of change in another parameter.
Duration of the impact	**Short term**: Lasting only till the duration of the project such as noise from the construction activities. **Medium term**: Lasting for a period of few months to a year after the project before naturally reverting to the original condition. **Long term:** Lasting for a period much greater than medium term impacts before naturally reverting to the original condition.
Geographical Location of the impact	**Local**: Within the area of project i.e. operation site and access road. **Regional**: Within the boundaries of the project area. **National**: Within the boundaries of the country. **Global**: Trans-boundary impacts
Duration	Complete construction, commission and operational activities
Likelihood of the impact	**High:** High likelihood of occurrence during lifetime of operation, Regular/continuous part of operations. **Moderate:** Moderate possibility of occurrence during lifetime of operation, Periodic/occasional part of operations.

Impact Characteristics	*Categories*
	Low: Unlikely to occur during lifetime of operation.
Reversibility of the impact	**Reversible**: When a receptor resumes its pre-project condition. **Irreversible**: When a receptor does not or cannot resume its pre-project condition.
Significance of the impact	**Major, Moderate, Minor, Negligible and Beneficial** Based on the consequence, likelihood, reversibility, geographical extent, duration, level of public concern and conformance with legislative or statutory requirements.
Consequence severity of impact	**High:** ❑ Serious/catastrophic damage to environment ❑ Direct legislative requirement ❑ Corporate requirement ❑ Serious threat to corporate reputation/profitability/ability to do business. **Medium:** ❑ Measurable damage to the environment ❑ Subject to potential future legislation ❑ Potential to affect reputation/cost ❑ Implication/reduced efficiency **Low:** ❑ Negligible damage to the environment ❑ No risk to business

1.6 Organization of the Report

This report has been structured in the following manner:

Chapter 1 (*Introduction*) gives an overview of project, its location, project proponent, project rational and EIA methodology.

Chapter 2 (*Legal Framework*) gives an overview of policy and legislation along with international guidelines relevant to EIA.

Chapter 3 (*Project Description*) provides the description of the proposed project, its layout plan and associated activities, raw material details and utility requirement.

Chapter 4 (*Project Alternatives*) this chapter provides site and technology options assessed for the project.

Chapter 5 (*Description of Baseline Environment*) provides a description of the environment of the proposed project site. This chapter describes the physical, ecological and socioeconomic resources, land of project area and surroundings.

Chapter 6 (*Stakeholder Consultation*) describes the stakeholder consultation approach adopted for this EIA study, identifies the concerned groups of stakeholders, and describes the consultation process carried out as part of this study.

Chapter 7 (*Impact Assessment*) describes the potential environmental and social impacts of proposed project on the different features of the environment using the matrix method.

Chapter 8 (*Environmental Management Plan*) explains the mitigation measures proposed for the project in order to minimize the impacts to acceptable limits. It also describes implementation of mitigation measures on ground and monitoring of environmental parameters against likely environmental impacts.

Chapter 9 (*Conclusion*) summarizes the report and presents its conclusions.

The last Chapter is followed by the references and series of Annexes that provide supporting information.

2 Legal Framework

The development of statutory and other instruments for environmental management has steadily gained priority in Pakistan since the late 1970s. The Pakistan Environmental Protection Ordinance, 1983 was the first piece of legislation designed specifically for the protection of the environment. The promulgation of this ordinance was followed, in 1984, by the establishment of the Pakistan Environmental Protection Agency (PEPA), the primary government institution dealing with environmental issues. Significant work on developing environmental policy was carried out in the late 1980s, which culminated in the drafting of the Pakistan National Conservation Strategy. Provincial EPAs were also established at about the same time. The National Environmental Quality Standards (NEQS) were established in 1993. The enactment of the Pakistan Environmental Protection Act (PEPA) 1997 conferred broad-based enforcement powers to the environmental protection agencies. The publication of the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations (IEE-EIA Regulations) 2000 provided the necessary details on the preparation, submission, and review of initial environmental examinations (IEE) and environmental impact assessments (EIA). However, after 18th constitutional amendment; Ministry has been devolved into provinces and federal ministry is working under the umbrella of Ministry of Climate Change. Now, Pakistan Environmental Protection Agency is an attached department of the Ministry of Climate Change and responsible to implement the Pakistan Environmental Protection Act 1997, in the country, an Act to provide for the protection, conservation, rehabilitation and improvement of environment, for the prevention and control of pollution, and promotion of sustainable development. Pakistan Environmental Protection Agency also provides all kind of technical assistance to the Ministry of Climate Change.

In addition to the PEPA 1997, Pakistan's statute books contain a number of other laws that have clauses concerning the regulation and protection of the environment.

This chapter provides a synopsis of environmental policies, legislation, and guidelines that may have relevance to the proposed project. These include:

- National environmental policy, legislation and guidelines; and
- International conventions and guidelines.

After 18th constitutional amendment; **Balochistan Environmental Protection Agency (BEPA)** is an administrative, implementation and enforcement body. The BEPA is headed by a Director General (DG) with the aim to exercise the powers and perform the functions assigned to it under the provisions of the Balochistan Environmental Protection Act 2012 and Pakistan EPA IEE /EIA regulations 2000. The BEPA has technical and legal staff and may form advisory committees. It also prepares environmental policies, takes measures for implementation of environmental policies & prepares Balochistan Environment Report.

BEPA shall also establish systems and procedures for surveys, surveillance, monitoring, measurement, examination, investigation research, inspection and audit to prevent and control pollution and to estimate the costs of cleaning up pollution and rehabilitating the environment and sustainable development. BEPA would also take measures for protection of environment such as to promote research; issues licenses for dealing with hazardous substances, certify laboratories, identify need for or initiate legislation, specify safeguards etc. BEPA would also encourage public awareness and education regarding environmental issues.

BEPA has powers to enter or inspect under a search warrant issued by Environmental Protection Tribunal or a Court search at any time, any land or building etc. where there are reasonable grounds to believe that an offence under the Act has been or is being or likely to be committed. BEPA may also take samples, arrange for testing or confiscate any article in discharge of their duties. The Act is annexed in this EIA report.

Premier Motors Limited will be required to adhere to the relevant requirements of the policies and legislation and recommendations of the guidelines during the proposed development activities; which have also been incorporated in the mitigation measures and the EMP's provided in the EIA.

2.1 National Environmental Policy, 2005

The National Environmental Policy (NEP) was approved by the Pakistan Environmental Protection Council (PEPC) in its 10th meeting on 27th December, 2004 under the chairmanship of the Prime Minister of Pakistan and thereafter approved by the Cabinet on

29th June 2005. NEP is the primary policy of Government of Pakistan that addresses the environmental issues of the country. The broad Goal of NEP is, "To protect, conserve and restore Pakistan's environment in order to improve the quality of life of the citizens through sustainable development". The NEP identifies the following set of sectoral and cross sectoral guidelines to achieve its Goal of sustainable development.

Sectoral Guidelines:

Water and sanitation, Air quality and noise, Waste management, Forestry, Biodiversity and Protected areas, Climate change and Ozone depletion, Energy efficiency and renewable, agriculture and livestock, and Multilateral environmental agreements.

Cross Sectoral Guidelines:

Poverty, Population, Gender, Health, Trade & Environment, Local governance & Environment and Natural disaster management.

The NEP suggests the following policy instruments to overcome the environmental problems throughout the country:

- Integration of environment into development planning,
- Legislation and regulatory framework,
- Capacity development,
- Economic and market based instrument,
- Public awareness and education, and
- Public private civil society partnership.

NEP is a policy document and does not apply to projects. However, Premier Motors Limited should ensure that the project should not add to the aggravation of the environmental issues identified in NEP and mitigation measures should be adopted to minimize or avoid any contribution of the project in these areas.

2.2 National Conservation Strategy

Before the approval of National Environmental Policy (NEP) the National Conservation Strategy (NCS) was considered as the Government's primary policy document on national environmental issues. At the moment this strategy just exists as a national conservation program. The NCS identifies 14 core areas including conservation of biodiversity; pollution prevention and abatement; soil and water conservation; and preservation of

cultural heritage, and recommends immediate attention to these core areas in order to preserve the country's environment.

Premier Motors Limited should ensure that the project should not add to the aggravation of the 14 core environmental issues identified in the NCS and mitigation measures should be adopted to minimize or avoid any contribution of the project in these areas.

2.3 Pakistan Environmental Protection Act 1997

The Pakistan Environmental Protection Act, 1997 (PEPA) is the basic legislative tool empowering the government to frame regulations for the protection of the environment. The PEPA is broadly applicable to air, water, soil, marine and noise pollution, as well as the handling of hazardous waste. Penalties have been prescribed for those contravening the provisions of the Act. The powers of the federal and provincial Environmental Protection Agencies (EPAs) were also considerably enhanced under this legislation and they have been given the power to conduct inquiries into possible breaches of environmental law either of their own accord, or upon the registration of a complaint. Under section 12 of PEPA, no project involving construction activities or any change in the physical environment can be taken unless an IEE or EIA as required is conducted and a report submitted to the federal and provincial EPA. After passage of 18th amendment by the parliament, Balochistan Government has enacted its own environmental law BEPA 2012 and Pakistan Environmental Protection Act 1997 is no more applicable in Balochistan Province.

2.4 Balochistan Environmental Protection Act, 2012

As a result of the 18th amendment to constitution of Pakistan, the Balochistan Environmental Protection Act, 2012 (amended) is now the principal provincial legislation in Balochistan for the:

1. Protection, conservation, rehabilitation and improvement of the environment,
2. Prevention and control of pollution, and
3. Sustainable development.

Balochistan Environmental Protection Act, 2012 is (currently) the basic legislative tool empowering the Government of Balochistan to frame regulations for protection of the environment in the province of Balochistan.

The Act is broadly applicable to air, water, soil, marine and noise pollution, as well as the handling of hazardous waste. Penalties have been prescribed for those who contravene the provisions of the Act. Powers of the Balochistan Environmental Protection Agency (BEPA) have been considerably enhanced under this legislation and they have been given the power to conduct inquiries into possible breaches of environmental laws either of their own accord, or upon registration of a complaint.

Under Section 15 of Act, "No proponent of a project of public and private sector shall commence construction or operation unless he has filed an Initial Environmental Examination with the Government Agency designated by Balochistan Environmental Protection Agency, as the case may be, or, where the project is likely to cause an adverse environmental effects an environmental impact assessment, and has obtained from the Government Agency approval in respect thereof".

The Act is attached as **Annex-I**I in this report.

2.5 Pakistan Environmental Protection Agency Review of IEE and EIA Regulations, 2000

The Pakistan Environmental Protection Agency Review IEE-EIA Regulations 2000 (the "Regulations"), pertaining to requirements of section 12 of PEPA 1997, provides the necessary details on the preparation, submission, and review of environmental assessment i.e. IEE and EIA, and categorize projects for IEE and EIA. and Environmental impact assessment (EIAs) are carried out for projects that have a potentially "significant" environmental impact, while, initial environmental examination (IEEs) are conducted for relatively smaller projects to determine whether they may have a "significant" impact (Section 12). Schedules I and II, attached to the Regulations list down the projects that require IEE or EIA, respectively. As per Sub Section J (2) of Schedule II of Regulation 2000, the project Automotive Manufacturing industry falls under any other project likely to cause an adverse environmental effect and total project cost greaten than 100 million rupees.

The submission and approval procedure for the EIA under the PEPA IEE and EIA regulations is summarized below:

- The EIA report shall be submitted, together with a review fee and form included as Schedule-III of the PEPA 2000 Regulations.

- Within 10 working days of filing of the IEE or EIA, the Federal Agency shall – confirm that the IEE or EIA is complete for purposes of initiation of the review process; or require the proponent to submit such additional information as may be specified; or return the IEE or EIA to the proponent for revision, clearly listing the points requiring further study and discussion
- The Federal agency is required to make every effort to complete the EIA review process within ninety days the issue of confirmation of completeness.
- In case of EIA submission, the federal agency shall call for a Public Hearing for the project to invite all the concerned persons to raise concerns on the project.
- Following the Public Hearing, Federal agency shall constitute a Committee of Experts to assist the agency in review of the EIA.
- The approval granted at the end of the review process is valid for three years for start of construction.
- Once project construction has been completed, the proponent is required to submit a request to the federal agency for confirmation of compliance. An environmental management plan for the operation phase is to accompany the request.
- The federal agency is required to communicate its decision within four months of receipt of the request. The project can commence operation only after it has received approval from the agency.

The regulation is attached as **Annex-III** in this report.

2.6 The National Environmental Quality Standards (NEQS)

The NEQS have been established for gaseous emission, liquid effluent, ambient air quality, noise, and drinking water under Section 11 of PEPA 1997. These standards will be applicable to the ambient air quality, gaseous emissions and liquid effluents discharged to the environment and noise generated from the proposed project. Following NEQS have been notified:

- Standards for Ambient Air Quality
- Standards for Ambient Noise
- Standards Municipal and Liquid Industrial Effluents

- Standards for Gaseous Emissions
- Standards for Motor Vehicle Exhaust and Noise

The BEPA 2012 empowers the Baluchistan EPA to impose pollution charges in case of non-compliance to the NEQS. During the construction and post development phase of the project, NEQS will apply to all type of effluents and emissions.

For the proposed project, the potentially applicable standards are based on the available project description. Different types of wastes generated and corresponding applicable standards are summarized in **Table 2.2 to Table 2.5.**

The National Environmental Quality Standards (NEQS) are attached in **Annex-I**V in this report.

2.7 Antiquities Act 1975

The Antiquities Act of 1975 ensures the protection of Pakistan's cultural resources. The Act defines "antiquities" as ancient products of human activity, historical sites, sites of anthropological or cultural interest, national monuments etc. This act is designed to protect these antiquities from destruction, theft, negligence, unlawful excavation, trade, and export. The law prohibits new construction in the proximity of a protected antiquity and empowers the Government of Pakistan to prohibit excavation in any area that may contain articles of archaeological significance.

Under this act, the project proponents are obligated to:

- Ensure that no activity is undertaken in the proximity of a protected antiquity.
- Report to the Department of Archaeology, Government of Pakistan, if any archaeological discovery made during the course of the project.

During the field visit no archaeological site was identified in the project area. Therefore, this law is not applicable to the proposed project.

2.8 The Pakistan Environmental Assessment Procedures, 1997

The Pakistan Environmental Protection Agency prepared the Pakistan Environmental Assessment Procedures in 1997. They are based on much of the existing work done by international donor agencies and Non-Governmental Organizations (NGO's). The package of regulations prepared by PEPA includes:

- Policy and Procedures for Filing, Review and Approval of Environmental Assessments;
- Guidelines for the Preparation and Review of Environmental Reports;
- Guidelines for Public Consultation;
- Guidelines for Sensitive and Critical Areas; and
- Sectoral Guidelines for Energy Projects.

2.9 Summary of National & International Policies, Legislation and Guidelines

A summary of the legislation, guidelines, convention and corporate requirements is provided in **Table 2-1.**

Table 2-1: National and International Polices, Legislations and Guidelines

Policy, Legislation or Guideline	*Description*
National Environmental Policy, 2005	The National Environmental Policy (NEP) is the primary policy of Government of Pakistan that addresses the environmental issues of the country, which was approved by the Pakistan Environmental Protection (PEPC) in its 10th meeting on 27th December 2004 under the chairmanship of the Prime Minister of Pakistan and thereafter approved by the Cabinet on 29th June 2005. The broad Goal of NEP is, "To *protect, conserve and restore Pakistan's environment in order to improve the quality of life of the citizens through sustainable development"*. The NEP identifies various set of sectoral and cross-sectoral guidelines in order to achieve its goal of sustainable development.
National Conservation Strategy	Before the approval of National Environmental Policy (NEP) the National Conservation Strategy (NCS) was considered as the Government's primary policy document on national environmental issues. At the moment, this strategy just exists as a national conservation program. The NCS identifies 14 core areas including conservation of biodiversity, pollution prevention and abatement, soil and water conservation and preservation of cultural heritage and recommends immediate attention to these core areas. Project activities to be conducted with the overall approach of protection and conservation of environment.
Biodiversity Action Plan	A plan prepared by the Government of Pakistan for the conservation of biodiversity. The plan recognizes IEE/EIA as an effective tool for identifying and assessing the impacts of a proposed operation on biodiversity.

Policy, Legislation or Guideline	*Description*
Balochistan Environmental Protection Act, 2012	Balochistan Environmental Protection Act, 2012 is (currently) the basic legislative tool empowering the Government of Balochistan to frame regulations for protection of the environment in the province of Balochistan. The Act is broadly applicable to air, water, soil, marine and noise pollution, as well as the handling of hazardous waste. Penalties have been prescribed for those who contravene the provisions of the Act. Powers of the Balochistan Environmental Protection Agency (BEPA) have been considerably enhanced under this legislation and they have been given the power to conduct inquiries into possible breaches of environmental laws either of their own accord, or upon registration of a complaint. Under Section 15 of Act, "No proponent of a project of public and private sector shall commence construction or operation unless he has filed an Initial Environmental Examination with the Government Agency designated by Balochistan Environmental Protection Agency or, where the project is likely to cause an adverse environmental effect an environmental impact assessment, and has obtained from the Government Agency approval in respect thereof".
Pakistan Environmental Protection Agency Review of IEE and EIA Regulations, 2000	The 2000 Regulations were promulgated under PEPA 1997 and enforced on 15 June 2000. The 2000 Regulations define the applicability and procedures for preparation, submission and review of IEEs and EIAs. These Regulations also give legal status to the Pakistan Environmental Assessment Procedures prepared by the Federal EPA in 1997. As per this regulation proposed project comes under Schedule-II which requires EIA.
National Environmental Quality Standards	A set of 32 quality standards applicable to liquid effluents, 16 parameters standards for gaseous emissions, 03 parameters standards for motor vehicle exhaust and noise, and noise levels (provided in Tables 2-2 to 2-5).

Policy, Legislation or Guideline	*Description*
The Forest Act 1927	The Act authorizes Provincial Forest Departments to establish forest reserves and protected forests. Under section 26, the Act prohibits any person to set fire in the forest, quarries stone, removes any forest-produce or cause any damage to the forest by cutting trees or clearing up area for cultivation or any other purpose. Section 23 of the Reserved Forests provides legal basis for acquiring rights of any description, in the form of a written grant or contract, in or over a reserved forest.
The Antiquities Act 1975	The protection of cultural resources in Pakistan is ensured by the Antiquities Act of 1975. The act is designed to protect "antiquities" from destruction, theft, negligence, unlawful excavation, trades and exports.
The Pakistan Environmental Assessment Procedures 1997	Provide guidelines for the preparation of environmental assessment reports, operation in environmentally sensitive areas, public consultation and conduct of manufacturing activities.
International Conventions and Guidelines	
The Convention on Conservation of Migratory Species of Wild Animals, 1979	Under this Convention Pakistan is required to take steps for the conservation of migratory species of wildlife animals and their habitats. The Convention contains two appendices. Appendix I contain the list of migratory species that are endangered according to the best scientific evidence available. Appendix II lists migratory species, or groups of species, that have an unfavourable conservation status as well as those that would benefit significantly from the international co-operation that could be achieved through intergovernmental agreements.
Convention on Biological Diversity	The Convention on Biological Diversity was adopted during the Earth Summit of 1992 at Rio de Janeiro. The Convention requires parties to develop national plans for the conservation and sustainable use of biodiversity, and to integrate these plans into national development programmes and policies. Parties are also required to identify components of biodiversity that

Policy, Legislation or Guideline	*Description*
	are important for conservation, and to develop systems to monitor the use of such components with a view to promoting their sustainable use.
The Convention on Wetlands of International Importance, Ramsar 1971	Obligates Pakistan to identify and protect wetlands in the country. So far 19 sites in Pakistan have been declared as wetlands of International Importance or Ramsar Sites. None of these wetlands is located within or in close vicinity of the project area.
Convention on International Trade of Endangered Species	Obligates Pakistan to regulate trade of endangered wildlife species.
International Union for Conservation of Nature and Natural Resources (IUCN) Red List 2000	Lists wildlife species experiencing various levels of threats internationally. Some of the species also present in the project area.
World Bank Guidelines on Environment	
Environmental Assessment-Operational Policy 4.01. & Environmental Assessment Sourcebook, Volume I	Provides general guidelines for the conduct of an IEE/EIA.
Environmental Assessment Sourcebook, Volume III	Provides guidelines for Environmental Assessment of Energy and Industry Projects.
Pollution Prevention and Abatement Handbook	Provides general waste management policies with specific techniques for the prevention of air and water pollution.
World Bank Environmental, Health, and Safety Guidelines for Petroleum Refining, 2016	This document provides an overview of environmental, health and safety issues of petroleum refining process and recommends mitigation measures to help minimize any potential impacts.

Policy, Legislation or Guideline	*Description*
International and National Environment and Conservation Organizations	**International and National Non-Governmental Organizations (NGO)** International environmental and conservation organisations such as IUCN and the World-Wide Fund for nature (WWF) have been active in Pakistan for some time. Both these organisations have worked closely with government and act in an advisory role with regard to the formulation of environmental and conservation Policies. Since the convening of the Rio Summit, a number of national environmental NGO's have also been formed, and have been engaged in advocacy, and in some cases, research. Most prominent national environmental NGO's, such as the Sustainable Development Policy Institute (SDPI), Strengthening Participatory Organization (SPO), Shehri, and Shirkatgah are members of the Pakistan National Committee (PNC) of IUCN. As mentioned earlier, environmental NGO's have been particularly active in advocacy, as proponents of sustainable development approaches. Much of the government's environmental and conservation policy has been formulated in consultation with leading NGO's, who have also been involved in drafting new legislation on conservation.

Table 2-2: NEQS for Municipal and Industrial Effluents [a]

Parameters	*Into Inland Water*	*Into Sewage Treatment[b]*
Temperature or temperature increase[c]	≤3°C	≤3°C
pH	6-9	6-9
Biochemical Oxygen Demand (BOD5) at 20°C[d]	80	250
Chemical Oxygen Demand (COD)[d]	150	400
Total Suspended Solids (TSS)	200	400
Total Dissolved Solids (TDS)	3,500	3,500
Grease and oil	10	10
Phenolic compounds (as phenol)	0.1	0.3
Chloride (as Cl^-)	1,000	1,000
Fluoride (as F)	10	10
Total cyanide (as CN-)	1.0	1.0
An-ionic detergents (as MBAS)[e]	20	20
Sulphate (SO_4)	600	1000
Sulphide (S-)	1.0	1.0
Ammonia (NH_3)	40	40
Pesticides[f]	0.15	0.15
Cadmium[g]	0.1	0.1
Chromium (trivalent & hexavalent)[g]	1.0	1.0
Copper[g]	1.0	1.0
Lead[g]	0.5	0.5
Mercury[g]	0.01	0.01
Selenium[g]	0.5	0.5
Nickel[g]	1.0	1.0
Silver[g]	1.0	1.0
Total Toxic metals	2.0	2.0
Zinc	5.0	5.0
Arsenic[g]	1.0	1.0
Barium[g]	1.5	1.5
Iron	8.0	8.0
Manganese	1.5	1.5
Boron[g]	6.0	6.0
Chlorine	1.0	1.0

Source: Pakistan's Environmental Laws and their Compliance, Dr. Shoaib Qadar, et.al (2003)

Notes

[a] All values are in mg/l, unless otherwise defined

[b] Applicable only when and where sewage treatment is operational and BOD5=80 mg/L is achieved by the sewage treatment system

[c] The effluent should not result in temperature increase of more than 3°C at the edge of zone where initial mixing and dilution take place in the receiving body. In case zone is defined, use 100 meters from the point of discharge

[d] Assuming minimum dilution 1:10 on discharge, lower ratio would attract progressively stringent standards to be determined by the Federal Environmental Protection Agency. By 1:10 dilution means, for example that for each one cubic meter of treated effluent, the recipient water body should have 10 cubic meter of water for dilution of this effluent

[e] Modified Benzene Alkyl Sulphate; assuming surfactant as biodegradable

[f] Pesticides include herbicide, fungicides and insecticides

[g] Subject to the total toxic metals discharge should not exceed level of total toxic metals

Table 2-3: NEQS for Drinking Water, 2010

Parameters	*Standards value for Pakistan*	*WHO Standards*
Physical & Bacterial		
E. Coli	Must not Detectable in 100 ml sample	Must not Detectable in 100 ml sample
Colour	≤15 TCU	≤15 TCU
pH	6.5-8.5	6.5-8.5
Taste	Non Objectionable/Acceptable	Non Objectionable/Acceptable
Odour	Non Objectionable/Acceptable	Non Objectionable/Acceptable
Turbidity	<5	<5
Total Hardness as $CaCo_3$	<500 mg/l	---
Total Dissolved Solids (TDS)	<1000	<1000
Chemical		
Essential Inorganic(mg/l)		
Aluminium (Al)	≤0.2	0.2
Antimony (Sb)	≤0.005 (p)	0.02
Arsenic (As)	≤0.05 (p)	0.01
Barium (Ba)	0.7	0.7
Boron (B)	0.3	0.3
Cadmium(Cd)	0.01	0.003
Chloride (Cl)	<250	250
Chromium (Cr)	≤0.05	0.05
Copper (Cu)	2	2
Toxic Inorganic mg/l		
Cyanide (CN)	≤0.05	0.07
Fluoride (as F)	≤1.5	1.5
Lead (Pb)	≤0.05	0.01
Manganese (Mn)	≤0.5	0.5
Mercury (Hg)	≤0.001	0.001
Nickel (Ni)	≤0.02	0.02
Nitrate (No_3)*	≤50	50
Nitrite (No_3)*	≤3 (p)	3
Selenium (Se)	0.01(p)	
Residual Chlorine	0.2-0.5 at consumer end 0.5-1.5 at source	---
Zn (Zn)	5.0	3
Organic		
Pesticide mg/l	---	PSQCA No.4639-2004 Page No. 4 Table No. 3 Serial No. 20-58 may be consulted***
Phenolic Compounds(as Phenols) mg/l	---	≤ 0.002
Polynuclear aromatic hydrocarbons(as PAH g/l)	---	0.01 (By GC/MS Method)
Radioactive		
Alpha Emitters bq/L or pCi	0.1	0.1
Beta Emitters	1	1

* Indicates priority health related inorganic constituents which need regular monitoring
*** PSQCA Pakistan Standards Quality Control Authority

Table 2-4: NEQS for Ambient Air Quality

Pollutants	*Time-weighted average*	*Concentration in Ambient Air*		*Method of measurement*
		Effective from 1st January 2008	*Effective from 1st January 2012*	
Sulphur Dioxide (SO_2)	Annual Average*	80 µg/m^3	80µg/m^3	Ultraviolet Fluorescence method
	24 hours**	120 µg/m^3	120 µg/m^3	
Oxides of Nitrogen as (NO)	Annual Average*	40 µg/m^3	40 µg/m^3	Gas Phase Chemiluminescence
	24 hours**	40 µg/m^3	40 µg/m^3	
Oxides of Nitrogen as (NO_2)	Annual Average*	40 µg/m^3	40 µg/m^3	Gas Phase Chemiluminescence
	24 hours**	80 µg/m^3	80 µg/m^3	
Ozone (O_3)	1 hour	180 µg/m^3	130 µg/m^3	Non dispersive UV absorption method
Suspended Particulate Matter (SPM)	Annual Average*	400 µg/m^3	360 µg/m^3	High Volume Sampling, (Average flow rate not less than 1.1 m^3/minute
	24 hours**	550 µg/m^3	500 µg/m^3	
Respirable Particulate Matter PM_{10}	Annual Average*	200 µg/m^3	120 µg/m^3	β Ray absorption method
	24 hours**	250 µg/m^3	150 µg/m^3	
Respirable Particulate Matter $PM_{2.5}$	Annual Average*	25 µg/m^3	15 µg/m^3	β Ray absorption method
	24 hours**	40 µg/m^3	35 µg/m^3	
	1 hour	25 µg/m^3	15 µg/m^3	
Lead (Pb)	Annual Average*	1.5 µg/m^3	1 µg/m^3	ASS Method after sampling using EMP 2000 or equivalent Filter paper
	24 hours**	2 µg/m^3	1.5 µg/m^3	
Carbon Monoxide (CO)	8 hours**	5 µg/m^3	5 µg/m^3	Non Dispersive Infrared (NDIR) method
	1 hour**	10 µg/m^3	10 µg/m^3	

* Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval
** 24 hourly/ 8 hourly values should be met 98 % of the in a year. 2 % of the time. It may exceed but not on two consecutive days.

Table 2-5: NEQS for Noise

S.No.	*Category of Area/Zone*	*Effective from Ist July, 2010*		*Effective from Ist July, 2012*	
		*Limit dB(A) Leq**			
		Day Time	*Night Time*	*Day Time*	*Night Time*
1	Residential Area (A)	65	50	55	45
2	Commercial Area (B)	70	60	65	55
3	Industrial Area (C)	80	75	75	65
4	Silence Zone (D)	55	45	50	45

*dB(A) Leq: Time Weighted average of the level of sound in decibels on scale A which is relatable to human hearing

Note: 1. Day time hours: 6.00 a.m to 10.00 p.m
2. Night time hours: 10.00 p.m. to 6 a.m.
3. Silence zone: Zones which are declared as such by the competent authority. An area comprising not less than 100 meters around hospitals, educational institutions and courts
4. Mixed categories of area may be declared as one of the four above-mentioned categories by the competent authority

3 Project Description

This chapter provides a description of the proposed construction and operation process, the project location, project schedule and details of the plant's process. Details are given on the main project activities, site preparation, construction and installation and operation. Finally, it provides information on the various discharges, waste and emissions likely to arise from the project and personnel requirements are provided as well as emergency response.

3.1 Project Objectives

Premier Motors Limited (PML) has intended to setup an automobile assembling and manufacturing plant at Sub District Gadani, District Lasbela, Balochistan in association with one of the world's largest automobile company Volkswagen.

The entry of the German Brand Volkswagen would improve the incurring industrial standards being taken up in the automobile industry of Pakistan. This joint venture of both the automotive companies will upshot in hefty incentives; as Government of Pakistan is offering special spurs for the new holders entering into the market. This will in-turn fetch lucrative options for the general population and will likewise include more in the economy of the nation.

For this purpose, 120 acres of land has been acquired by PML, considering the future expansion plans as well. The company is planning to work in phases in the country as it will build up to 30,000 units per year with the Amarok and Transporter T-6.

3.2 Project Location & Area Features

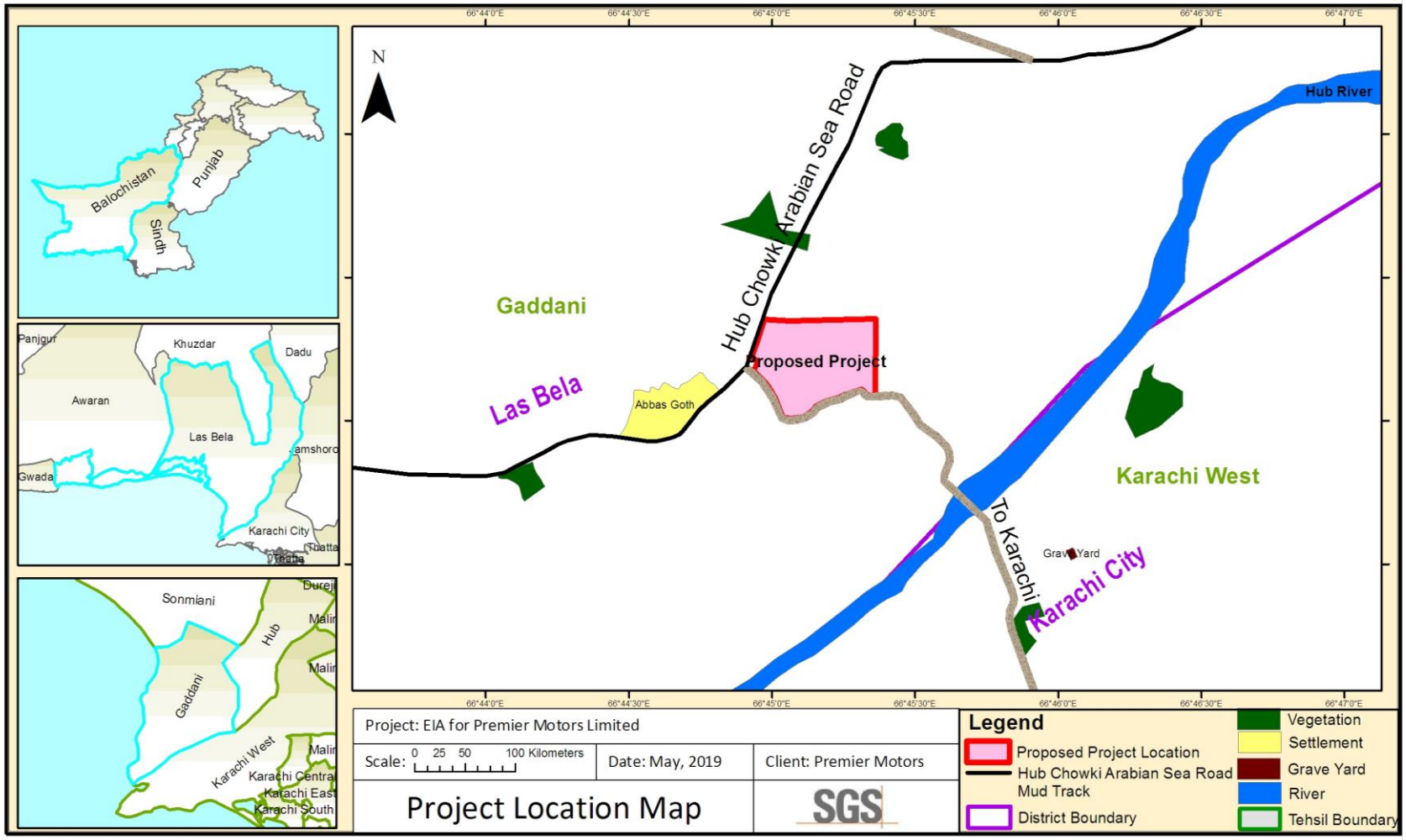
The proposed automotive manufacturing complex covered area is 120 acres and situated ~ 600m in northeast of Goth Abbas (Haji Shah Baig), Mouza Kund, U.C Gadani, Sub District (Tehsil) Gadani, District Lasbela, Balochistan. The proposed project site is situated at ~16km in southwest of Hub Chawki and can be accessed through Hub Chawki-Arabian Sea Road from main Hub City. Another access route is situated in southwest of project area which connects to Goth Mubarak Road and onwards to Karachi. The proposed project area is given in **Figure 3.2.**

Figure 3-1: Proposed Project Area

According to the present situation of natural conditions, the project area does not belong to the earthquake, typhoon, and flood prone areas. There are no large faults within the project area, strata are relatively stable, and the geological conditions such as landslide and collapse were not observed during field survey. Mostly, project area is a barren land with flat topography and partially covered with *Prosopic Juliflora.*

	
Hub Chawki- Arabian Sea Road (Project Area Main Access road) situated in North-West of project area	Secondary access road situated in South-West, South and South East of project area which connects to Goth Mubarak road and onwards to Karachi.

Figure 3-2: Project Location Map



3.3 Project Tentative Schedule

The proposed project activity from design phase, commencement of site preparation to commissioning and full operation phase is expected to last approximately eighteen (18) months. Proposed schedule is divided into five stages, namely: preparation stage, design stage, procurement stage, construction stage and operation stage. A breakdown of the activity phase is as provided below:

- From January to February 2019: complete the Basic Design, reported in March 2019, and reviewed in;
- April 2019: Beginning of equipment ordering, Detailed Design begin in May 2019,
- June 2019: Beginning of the underground Engineering Construction;
- March 2020: All Project Delivery;
- April 2020: Installation;
- July 2020: Commissioning;
- December 2020: Production;

3.4 Project Components

The new automotive plant is intended to manufacture cars and trucks. The automotive manufacturing plant shall consist of the following major units:

- Body Shop;
- Paint Shop;
- Assembly Shop;
- Performance Inspection & Test Track;

In addition, PML will have following utility system / auxiliary supporting units:

- Water supply system and consumption;
- Wastewater Treatment Plant;
- Electrical system;
- Heavy Fuel Oil Tanks;
- Test Track

- Fuel Tanks Yard;
- Multi-Energy Absorption Chillers/Pumps;
- Container Yard;
- Scrap Yard;
- Ware House;
- Control room-process, control instrumentation;
- Building such as offices, laboratory, warehouse, workshops, shift worker's apartment, canteen and dispensary;

3.5 Vehicles Type

Initially, PML is planning to manufacture following 02 type of vehicles;

- Amarok
- T-6 Transporter

Figure 3-3: Amarok-Volkswagen

Figure 3-4: Transporter-Volkswagen

Vehicles Exhaust Emission Standards

Proposed vehicles shall be designed to meet the requirements of exhaust emissions defined in EURO-3 (EC 2000) & EURO-4 (EC 2005)

EURO 3 (EC 2000)

Euro 3 modified the test procedure to eliminate the engine warm-up period and further reduced permitted carbon monoxide and diesel particulate limits. Euro 3 also added a separate NOx limit for diesel engines and introduced separate HC and NOx limits for petrol engines.

EURO 4 (EC 2005)

Euro 4 concentrated on cleaning up emissions from diesel cars, especially reducing particulate matter (PM) and oxides of nitrogen (NOx)

Table 3-1: Vehicles Exhaust Emissions Standards

Sr. No.	*Parameters*	Euro 3 (EC 2000)		Euro 4 (EC 2005)	
		Petrol	Diesel	Petrol	Diesel
1.	CO	2.3 g/km	0.64 g/km	1.0 g/km	0.50 g/km
2.	HC	0.20 g/km	0.06 g/km	0.10 g/km	0.05 g/km
3.	NOx	0.15 g/km	0.50 g/km	0.08 g/km	0.25 g/km
4.	PM	-	0.05 g/km	-	0.025 g/km

3.6 Plant Assembly Process

Vehicle manufacturing facilities are more accurately described as assembly plants as they restrict themselves to producing body parts, installing the engine, final assembly and painting.

Assembly plants process is a production methodology that breaks a process down into discrete steps that are executed in an interactive manner. Assembly line production has its roots in manufacturing and is often associated with the mass production of automobiles.

Premier Motors Limited intends to bring the latest available technology developed by Volkswagen and compatible with the local conditions for higher safety and lower environmental impact. The proposed process flow is given in **Figure 3.5** and plant layout of proposed plant is mentioned in **Figure 3.6.**

Figure 3-5: Proposed Plant Layout Plan

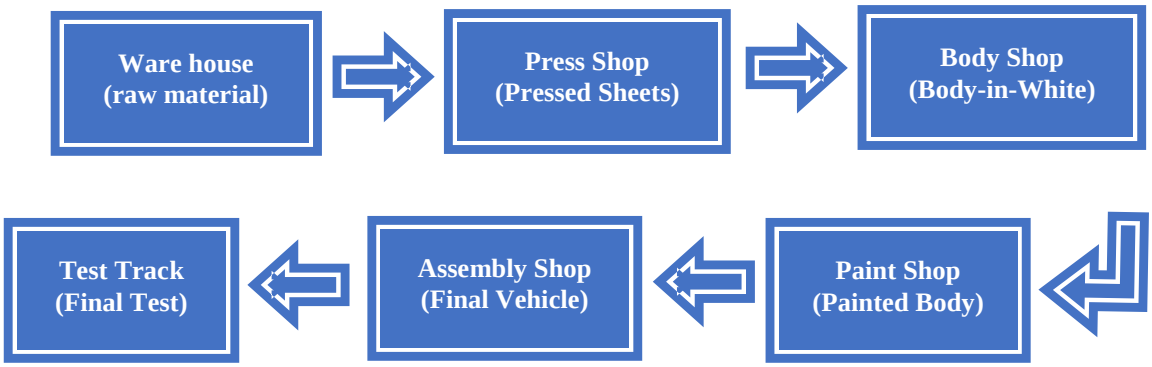


Figure 3-6: Proposed Plant Layout Plan

3.6.1 Press Shop

The production process starts in press shop with most of the metal parts getting pressed out of steel sheets. The door panels, roof, boot lid etc are typically pressed in to form the basic structure of the automobile. The pressing process is a multi-step process where the sheets are pressed into shape in stages.

Major equipment use in the press shop includes the following;

- Dies;
- Flywheels;
- Robot Arms;
- Hydrolytic machines

Figure 3-7: Press Shop Illustration[1]

[1] Volkswagen-newsroom.com- Quality Check at Volkswagen Press Shop

3.6.2 Body Shop

The body shop is typically the place where the automobile structure is manufactured. The pressed parts undergo into welding process for the progression of initial structure. This is the joining platform unit of the underbody front & rear or in some cases the entire underbody can be a single pressed unit.

In stages, the side panels, the roof are then welded to the underbody and the automobile begins to take its shape. The welding process mostly done by robots and, wherein all multi axis robotic arms work in unison and utmost precision.

The shell of the automobile assembled in this section of the process lends itself to the use of robots because articulating arms can easily introduce various component braces and panels and perform a high number of weld operations in a time frame and with a degree of accuracy no human workers could ever approach. Robots can pick and load heavy roof panels and place them precisely in the proper weld position with great perfection. Moreover, robots can also tolerate the smoke, weld flashes, and gases created during this phase of production. As the body moves from the isolated weld area of the assembly line, subsequent body components including fully assembled doors, deck lids, hood panel, fenders, trunk lid, and bumper reinforcements are installed.

Major equipment use in the press shop includes the following;

- Robotic Welding Jigs & Fixtures; Robotic Welding Guns;
- Welding Transform & Hydraulic Hoists

Figure 3-8: Body Shop Illustration

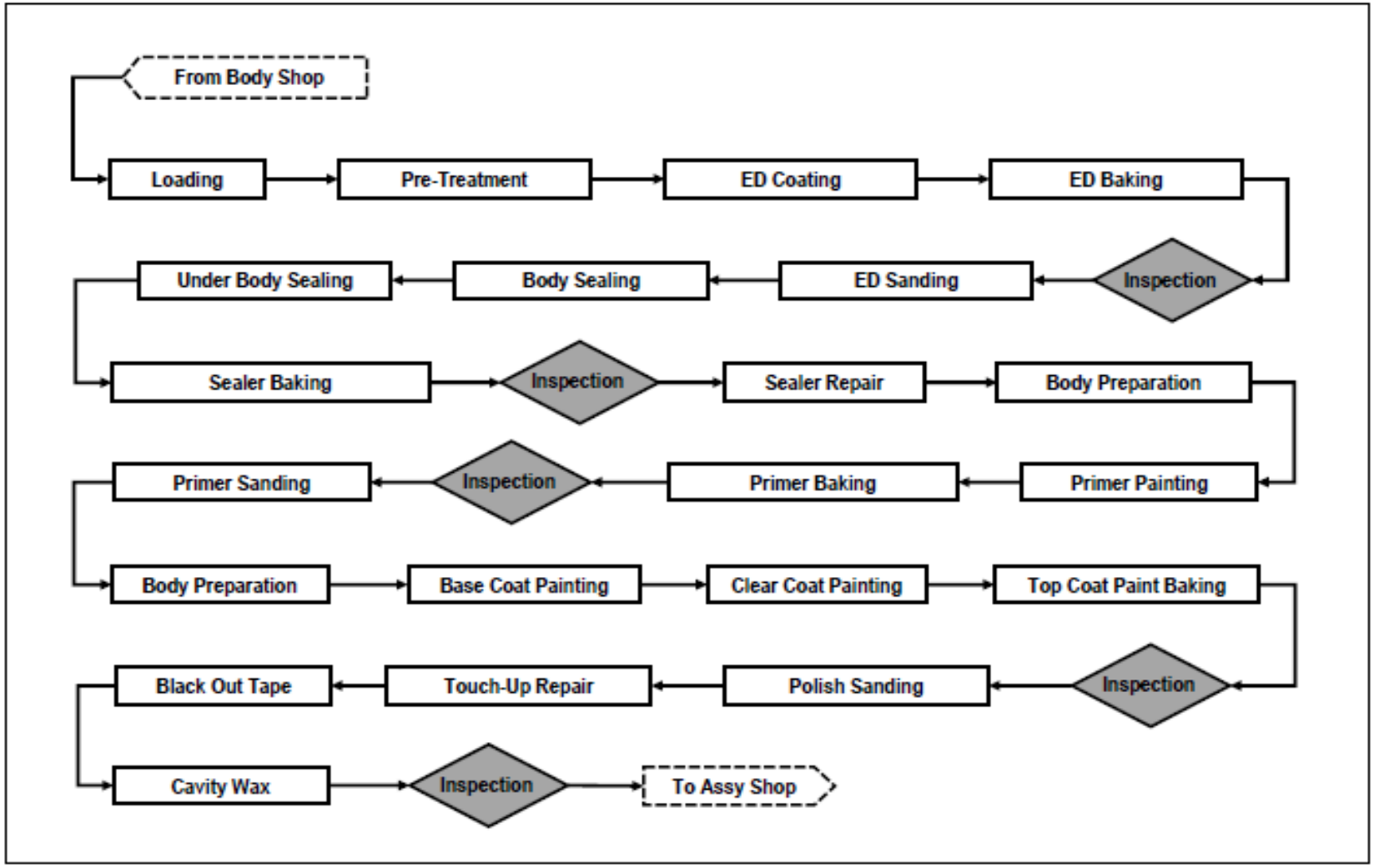
3.6.3 Paint Shop

The unpainted vehicle body (also known as the "Body-in-White") is assembled from formed body panels joined by welding, glue and riveting. The painting process is one of the most complex and cleanest of process. The vehicle passes by conveyor to the paint shop and the various sub-process include the following

- **Pre-treatment (degreasing and anti-corrosion inhibitor):** where the Body in White (BIW) is dipped into an electrolyte solution which would help in better paint deposition on the metal.
- **Sealant:** Prior to the application of paint, the BIWs enter the sealant area where the sealant is applied.
- **Paint Booth:** The BIWs enter the paints booths, for the final painting process. This is typically an area where it is mostly robots again which do the job, or you would need highly skilled human workforce. A highly clean environment is maintained and access is limited and if at all, it has to be with wearing the right kind of overalls.
- **Oven:** The painted bodies are then passed through the oven where the final baking process of the paint takes place.
- **Wax Booths:** Where application of a fine layer of wax takes place. This is sometimes skipped for some local market vehicles or the lower variants.
- **Polishing:** One of the most laborious processes and the most time consuming one as well. Each of the cars are polished to give the right shine and gleam. A simple rule of thumb, the longer and more elaborate the polishing process, the better is the shine. So the costlier the car, the longer would have been the polishing done on it.

Figure 3-9: Paint Shop Illustration

Figure 3-10: Process Flow of Paint Shop



3.6.4 Assembly Shop

The assembly process is the final stage for the automobile production where most of the fitment is usually done by manually. The assembly shop consists of trim line, chassis line and final line.

The assembly process of the Engine is again precision controlled with various stages of machining the Pistons, fitment of the Piston rings and then lowering the assembly into the Engine Block. The engines are then "pre-run" in some cases before getting mated to the TransAxle. The TransAxle, consisting of the Gear Box assembly is typically made ready and made available at the fixing point. The Sequence of production of the Engine closely follows the Production of the Vehicle Body and that of the TransAxle closely follows the sequence of engine production. Most of the component of the car like windshields, trims, steering column, electronics and other necessaries get assembled into the painted body.

Major equipment use in the assembly shop includes the following;

- Trim Line;
  - Sealer Pumps
  - Conveyors
  - Pneumatic Tools
  - Torque Wrenches
- Chassis Line;
  - Central Lifter
  - Engine Docking Machine
  - Axle Lifting Machine
  - Wheel Subassembly
  - Wheel Balancing
  - Pneumatic Tools
- Feeder Line;
  - Coolant Feeder
  - Brake Bleeding Machine

Figure 3-11: Assembly Line Illustration

3.6.5 Performance Inspection & Test Track

Finally, after the wheels come in, the vehicle becomes capable of moving by its own power. Before getting dispatched out of production, the vehicle undergoes stringent quality tests as well as the various important component information of the vehicle is captured and stored into the production databases. Performance & Inspection testing facilities include the followings;

- Alignment Tester
- Side Slip Tester
- Brake Tester
- Turning Radius
- Headlight Aiming Tester
- Shower Tester
- Rolling Tester

3.7 Details of Activities During Different Phases of Proposed Project

3.7.1 Construction Phase

During construction phase, following activities would be carried out:

- Earth work to achieve the required level of the plot/area;
- Excavations to build heavy to medium type equipment/building foundations;
- Reinforced concreting;
- Construction of storage tanks and various piping systems;
- Erection of heavy equipment/very high distillation towers/flare;
- Installation of electrical systems;
- Steam generation.

Workers' Camps and Construction Site

Workers camps during construction phase of project shall be established at site with all facilities such as potable water, power, recreational facilities, sewage, sanitation facilities etc. Designed workers camp capacity is put at 1,000 to 1,500 numbers at the peak construction stage. Ground water shall be used for providing potable and drinking water to workers and others during construction phase.

Construction site including sheds, welding bays etc.:

Following facilities shall be set up for Construction works:

- Pre-fabrication workshop with Automatic welding machines, shot blasting machine, EOT cranes etc
- Painting shop
- Civil yard
- Batching plant
- Piling works yard

3.7.2 Commissioning Phase

This phase will comprise the following activities:

- Hydraulic/pneumatic testing of various systems;
- Energizing all electrical equipment;
- Production and distribution of steam;
- Functioning of all control and monitoring systems;
- Functioning of all utilities system, e.g. water supply, cooling water, gas etc.

Miscellaneous Work

Miscellaneous works in the plant include the following:

- Application of Hot and Cold Insulation
- Painting work
- Fire proofing of structures, wherever applicable.

3.7.3 Operation Phase

This phase will comprise the following activities:

- Hydraulic/pneumatic testing of various systems;
- Energizing all electrical equipment;
- Production and distribution of steam;
- Functioning of all control and monitoring systems;
- Functioning of all utilities system, e.g. water supply, cooling water, gas etc.

Miscellaneous Work

Miscellaneous works in the plant include the following:

- Application of Hot and Cold Insulation
- Painting work
- Fire proofing of structures, wherever applicable.

3.8 Utilities & Infrastructure

3.8.1 Power Supply

It has been estimated that the total power load demand will 10 MW for the proposed project. This power demand is proposed to be met through self-generation system.

3.8.2 Fuels

The low sulfur heavy fuel will be used for the backup generators, construction equipment such as graders, excavators, dumpers, tractors & mobile cranes.

3.8.3 Water Supply and Drainage

The part of water supply and drainage mainly provides the safe and reliable industrial and domestic water for process facilities, utilities, auxiliary production facilities, the office and living areas, ensure wastewater treatment of each unit reaching the standard and reuse, while providing the necessary fire facilities for the facilities. The design mainly includes: 1 set fresh water treatment plant, 1 set reverse osmosis water plant, 1 set fire extinguishing station, 2 set foam stations and water supply and drainage piping network.

Raw water comes from the groundwater. It is pumped by deep well pump to the plant wall boundary, through the water pipe laying underground.

The water consumption of the plant (including production water and domestic water area) is 150,000 gallons/day. The water sources would be newly built groundwater sources. The number of set water source wells would be drilled, and the water content of the single well will be designed by around 80m^3/h in groundwater source. Majority of set well will work usually, when there is replenishing fire water and the standby is 3-6 set wells. In the project area, the depth of water well near the village (Goth Abbas) is about 20feet to 60feet deep.

The discharge of the assembly plant includes the industrial wastewater, domestic wastewater, fire water and so on and the estimated drainage during normal continuous operation would be 75,000 gallons/day and reverse osmosis discharges would be around 250,00 gallons/day.

Reverse Osmosis Plant

To treat the ground water, Reverse Osmosis (RO) Plant will be installed having capacity of 150,000 gallons per day. It will be designed for feed water inlet around 400,00 gallons/day which is approximated 35% recovery. The rejected discharge would be around 250,000 gallons per day.

Wastewater Treatment Plant

Wastewater treatment plant will be installed to treat the effluent of proposed project. The treatment plant will be based on technology Moving Bed Biofilm Reactor (MBBR) which is a highly effective treatment process consist of combination of conventional activated sludge process and biofilm media.

The MBBR process utilize floating High Capacity MicroOrganism BioChips media within the aeration and anoxic tanks. The microorganisms consume organic material. The media provides increased surface area for the biological microorganisms to attach and grow. The increased surface area reduces the footprint of the tanks required to treat the wastewater. The treatment process can be aerobic and/or anaerobic and operates at high volume loads. The MBBR technology advantages include the following;

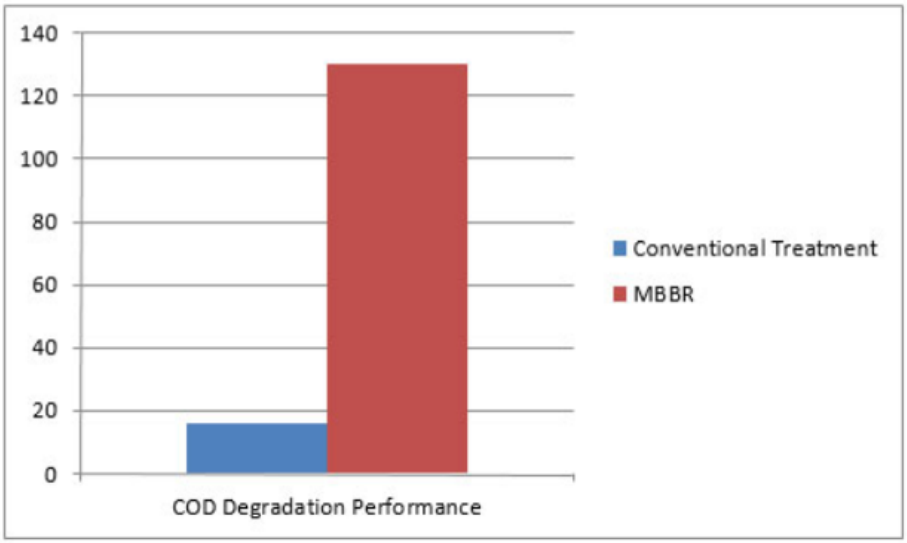
- Compact units with small size

- Increased treatment capacity
- Complete solids removal
- Improved settling characteristics
- Operation at Higher suspended biomass
- Concentrations resulting in long sludge retention times
- Enhanced process stability
- Low head loss
- No filter channeling
- No need of periodic backwashing
- Reduced sludge production and no problems with sludge bulking

The MBBR process utilizes floating plastic carriers (media) within the aeration tank to increase the amount of microorganisms available to treat the wastewater. The microorganisms consume organic material. The media provides increased surface area for the biological microorganisms to attach to and grow in the aeration tanks. The increased surface area reduces the footprint of the tanks required to treat the wastewater. The media is continuously agitated by bubbles from the aeration system that adds oxygen at the bottom of the first compartment of the aeration tank. The microorganisms consume organic material. When compared to conventional secondary treatment it provides superior efficiency and value.

The following chart shows the differences in COD degradation achieved by conventional secondary treatment versus MBBR treatment. Figures represented are in kg/m^3.

Figure 3-12: Comparison of Performance of Conventional Treatment v/s MBBR



3.8.4 Buildings and Structures on Site

Other buildings that will be erected on the site include:

- Administration buildings
- Stores
- Canteens
- Control and technical building
- Electrical Substations
- Workshop
- Laboratory
- Guard house

3.8.5 Development of Greenbelts

A conspicuous attempt has been made by Premier Motors Limited to ensure that the project is environmentally friendly as demonstrated by the sumptuous provision of greenbelts towards the north, north east, north west, south, south east and south west of the

project site. These belts are to be well landscaped and planted with both indigenous and exotic trees.

3.8.6 Communication System

The design for telecommunication system includes: Fire alarm dispatching exchange system, Fire alarm system, Audio communication system, Computer network cabling system, Satellite TV receiving system, closed circuit television system, Border guard system, Vehicle and personnel management system, Explosion-proof broadcasting system and Radio communication system in the power station, living base, working area, storage yards and processing units of plant.

3.8.7 Security and Access Control

The adopted CCTV and Security systems shall be based on the use of an integrated management platform. Thus, they shall be implemented as one (1) fully integrated overall system.

3.8.8 Fire Fighting Protection

The fire protection system has been designed in accordance with the requirements of the NFPA standard. The National & International Standards, Codes and Manuals have been referred to for deciding the basic parameters like materials, fabrication and testing of the fire equipment. The basis of design has been considered for fighting two major fires simultaneously. The salient features of Fire Protection Systems are as under.

- Fire water reserves meet the requirements of the two fires at the same time, one for the main production process; another for auxiliary production facilities.
- Uses a fixed foam fire extinguishing system for a tank with a volume of more than or equal to 1000 m^3.
- Uses a fixed spray cooling system for a tank with a volume of more than or equal to 1000 m^3.
- In the process plant area, the mobile or semi-fixed fire protection system is adopted, which depends on various types of fire engines and fixed water cannon extinguishing devices.

- In order to put out the small fire and the initial fire, the equipment, the tank farm and the unit are all provided with the small fire extinguishing equipment according to the regulation.

3.9 Resource Requirement

3.9.1 Staffing & Workers

During construction activities, base camps will be prepared to house around 1500-2000 workers of which local labors will be employed for un-skilled or semi-skilled jobs. The camp will be located and constructed such that minimum clearing of vegetation or land is involved. The base camp will include accommodation area including tents and portacabins; senior and junior kitchens and mess; laundry area; toilets; workshops; vehicle parking area; equipment storage areas; fuel and oil storage area; generator area, septic tanks and soak pits; and a garbage pit. The camps will be fenced for security reasons.

It is expected that around 800~1000 personnel skilled and unskilled staff will be appointed during operational phase of the project. Local people will be given preference for semi-skilled and unskilled jobs.

3.9.2 Supplies

Supplies for camp operation and equipment maintenance will be brought from the nearest source or if required from the project area surroundings during construction activities. Fuel for power generators, equipment, machinery, and vehicles will be transported to the camps in tank lorries.

Gravel, sand, bricks, and cement required during the construction activities will be sourced from licensed suppliers in Hub city and transported to the base camp for storage through trucks. These will then be moved to different sites (access road, campsite etc.) when the need arises.

All supplies will be transported to site by truck. These will include all fuels and oils, chemicals, equipment and vehicles and food and other supplies for the residential camp. Fuels, oils and chemicals will be unloaded in designated areas with impermeable floors (either concrete or covered with an impermeable material) and lined by dykes or walls to prevent soil and water contamination from spills.

According to the requirements of the process packages, the main catalyst in the project would be internationally procurement, and the other materials will be purchased in Pakistan in principle.

3.10 Waste Discharge

3.10.1 Discharge of Liquid Effluent from The Plant

Apart from storm water generated during the wet season, following waste water streams are getting generated in various process units and off sites during processing of proposed plant. The total waste water generation is expected to be 75,000 gallons/day during the continuous operation and the RO rejected water will be 250,00 gallons/day

Sanitary Wastewater: Sanitary wastewaters mainly comes from factory canteen, bathroom, office building and toilet installed in each building unit (toilet wastewater should be pre-treated in the cesspool). The main pollutants of sanitary wastewater are COD, ammonia, nitrogen, which are sent to effluent treatment plant (ETP) through sanitary wastewater pipeline.

Effluent Treatment Plant: A modern MBR effluent treatment facility will be provided to treat all these streams. The design scale of effluent treatment facilities is 500m^3/h, and it uses A/O biochemical reaction, high density coagulation sedimentation and multimedia-filtration" process. The treated water is used as the makeup water for the circulating cooling water system.

3.10.2 Project Specific Waste Management

Various types of wastes are generated while operating automotive industry. Managing these wastes plays a vital role in the industry. Waste Management flows in a cycle: monitoring, collection, transportation, processing, disposal or recycle. Through these steps, a company can effectively and responsibly manage waste.

All efforts will be made to minimize the waste generated during the proposed project. The main types of waste that will be generated are:

- Fuels, oils, and chemicals
- Garage waste
- Sewage

- Camp waste
- Medical waste.
- Process waste includes: waste catalyst, waste adsorbent (desorbing agent), effluent treatment plant sludge, storage tank oily sludge, activated sludge, coagulation sedimentation tank sludge generated by oil separating pool sediment, flotation tank sludge etc.

Waste management procedure is enlisted below.

Procedure of Waste Management

Waste Management can be divided into below steps:

- Segregation
- Classification
- Packing and labelling
- Transportation
- Storage
- Disposal

All wastes generated in the plant shall be segregated at source as per internal procedures and will be categorized as hazardous or non-hazardous based on the best prevailing Hazardous Waste Management & Handling practices in the industry. Wastes will be packed in either drums or jumbo bags depending on their characteristics and then shall be properly labelled with the details and date of generation. After labelling, it shall be transported to the designated storage location (covered shed with concrete flooring). Waste disposal hierarchy is as follows:

Reuse: To see whether the wastes can be used as it is inside the plant itself

Recycle: To sell the waste to registered recyclers outside in case of hazardous and through open bidding in case of non – hazardous wastes

Landfill: Send the waste to a registered landfill site for treatment and secured landfilling.

Incineration: If all the above methods are not possible for disposal then the wastes shall be sent to registered incineration site.

3.10.3 Noise

The following activities are likely to generate noise during the proposed project:

- Vehicular traffic on the access road during construction activities and bowsers for crude oi transport during operational phase of project.
- Diesel generator operation during construction and commissioning phase of project.
- Construction machinery operation along the access road and campsite.
- During operational phase of project, main sources of noise would be process equipment (furnaces, compressors, pumps etc).

Adequate control measures are adopted in design of refinery/selection of equipment to reduce the noise.

Vehicular traffic is expected to generate 60 to 70dB(A) of noise, the diesel generators up to 82dB(A), and the construction machinery up to 98 dB(A), each measured at a distance of 15 m (Davis and Cornwell, 1991). Since the generators will operate through the night, when noise could be a cause of concern, measures will be taken to minimize the noise level, if required.

3.10.4 Vehicular Traffic

Vehicular traffic during the proposed project will typically be generated because of the following reasons:

- Personnel and machinery mobilization during construction, commissioning and operational phase of project.
- Transportation of supplies (construction materials, camp supplies, water, fuel, etc.) during construction, commissioning and operation phase of project.
- Personnel and machinery movement between camps, construction/commissioning sites (access road) etc.
- Personnel and machinery demobilization from construction sites etc.

3.11 Emergency Response Plan (ERP)

The objective of the ERP is to ensure that any emergency affecting the place of operational activities is dealt with in an efficient and professional manner so that the safety

of personnel is not compromised in any way, the environmental pollution risks are prevented or minimized and that all other losses which may arise from emergencies are prevented or minimized. The ERP addresses emergency response procedures for the Contractor, Subcontractors and all personnel working for the Project.

It is the responsibility of management to familiarize itself with the emergency procedures, which apply to the project. The ERP will include as a minimum the following:

a) Emergency Communication Procedures: These include a description of the communication procedure and command hierarchy to define who is responsible for directing the activities of the various respondents, and the means of maintaining communication between the facility operators, Emergency Response Contractor, Company and Local Emergency Services.

b) Identification of potential scenarios (fire, severe injury, road traffic accident, Incident, spills etc.) and action plans.

c) Site Specific ERP Orientation: Training for site personnel and visitors.

d) Emergency Events Log: The Contractor is required to log all emergency events and report them to the Company and appropriate regulatory authorities.

e) Emergency Contact List: listing of Contractor personnel, Emergency Response Contractor(s), and Emergency Services to contact with primary and secondary contact information.

f) Emergency Equipment List and Alarms.

g) Emergency Response Team: description of the roles of Contractor and Subcontractor field and support personnel during an emergency.

h) Emergency Support Services: Description of emergency conditions requiring procedures for implementing additional help from Company and Contractor.

Work shall be conducted in accordance with ERP requirements. Field HSE Manager shall ascertain the effectiveness of Emergency Response plan by conducting audits and organizing exercises/drills to the work force regularly. All personnel involved in the emergency response group shall also be familiarized with their roles and responsibilities by regular exercises/drills.

Field HSE Manager will issue the performance report of each exercise/drill conducted at site to the Project Management team (PMT) containing the information on

recommendations to be taken for improvement. Following are potential foreseen types of emergency expected but not limited to:

- Fire and explosion;
- Oil, Chemical spills and release;
- Medical Evacuation;
- Vehicle accidents;
- Work at height.

3.12 Health Safety and Environment (HSE) Plan

The purpose of HSE Plan is to define the HSE Policy and Management Commitment and to describe briefly how these issues will be implemented during the execution of the Premier motors Project. This Plan will remain in force throughout the entire project and will be updated as project conditions change, in order to ensure that it always addresses them appropriately.

The Project HSE Plan is of primary importance in ensuring that HSE issues are comprehensively addressed to all interested parties involved in the Project, during all the stages of the Project development, and that all Project choices and decisions are justified with respect to their implication for HSE issues during design, construction and commissioning. The HSE Plans is a "living document" and will remain in force throughout the life of the Project. The HSE Plan shall continuously be reviewed to ensure that appropriate update is made as dictated by circumstances during the Project activities. This plan shall be considered as a general guideline for the management of the Project HSE issues and shall be made available also to Vendors and construction Contractors and give the baselines for the preparation of their HSE plans.

HSE Policy

The Project will fully comply with Policy statement on HSE. The policy shall reflect the commitment of Top Management to the protection of the environment, and the health and safety of its personnel and all people that could be affected by its operations. The HSE Policy is the base upon which the Project HSE objectives are set.

Management Commitment

The implementation of the integrated HSE Management System, in accordance with the HSE Policy statement, is integrated into business objectives. Where conflict may exist between HSE and other business objectives, Management will promote resolution of such conflicts so that the outcome is consistent with the HSE Policy. Management leadership and commitment are the drivers upon which the HSE Management System is implemented in order to ensure that continuous improvement is achieved.

Management shall communicate to all Contractor's and Subcontractor's employees a sound commitment towards the achievement of the highest HSE standards. Through active consultation and involvement, employees shall be encouraged to contribute to success in meeting this commitment. Effective motivation and communication tools to manage and communicate HSE issues shall be realized within the organization, where the HSE Management System is implemented at all levels and HSE responsibilities are clearly defined and assigned.

Project HSE Organization and Responsibilities

The Company strives at appointing a dedicated HSE Team for the Project which will be capable of meeting the Project Health, Safety and Environmental objectives through implementation of procedures and technical activities.

3.13 Dismantling

The Assembly Plant has been designed to have a life of at least 75 plus years, and an industrial site built for the future centuries, with continuous maintenance. Taking into account this consideration, dismantling and recovery of the land in original state is a scenario that's highly unlikely to occur in this project.

4 Project Alternatives

This chapter provides an analysis of available alternatives to the proposed project that has been carried out to ensure the best possible management and technology options. The following alternatives have been identified and are discussed in further detail below:

- Alternative-I 'No Development Option'
- Alternative-II 'Alternative Site Option'
- Alternative-III 'Technology Option'

4.1 No Development Option

No development of proposed project option means that the country will continue to import vehicles to meet its future needs and will be mostly dependent on world market & exchange rate variations.

In consonance with the vision of the Automotive Development Policy (ADP) 2016-2021, following goals have been opted reflecting the future demand of the country by recognizing the need to restructure and modernize the Auto Industry.

- To increase automotive production gradually by 2021 to:
    - Cars/Van/Jeeps: 350,000
    - Light Commercial Vehicles (LCVs): 79,000
    - Trucks: 12,000
    - Buses: 2,200
    - Tractors: 88,000
    - Motorcycles: 2,500,000

- To increase contribution of automotive industry to Gross Domestic Product from 2.3 percent to 3.8 percent;
- To increase contribution to manufacturing from 22 percent to 30 percent, and
- To increase direct and indirect employment from 2.4 million presently to 4 million.

The No-action or No Development Option will keep the country to further dependency on automobile import or slow down its economic growth. The "No-action" alternative does not seem plausible given the legitimacy of the proposed project rationale and the benefits to be derived. Pakistan's trade deficit would not improve and the country will remain susceptible to high automobile products prices.

This project has a minimum environmental and social impacts; the proposed plant is also expected to provide around 1500 - 2000 jobs in construction phase and 800 – 1000 during its operation phase. In addition, there will be a transfer of latest technology associated with installation, operation of the equipment and maintenance; and, savings on foreign exchange, hence this alternative is chosen.

Hence the proposed project is very important to fill the gap and to reduce dependence on imported automotive and to reduce heavy burden on foreign exchange resources.

Loss of employment and development of infrastructure, are the other losses which will be a result of 'No-Action' option.

4.2 Alternative Site Option

The proposed automotive manufacturing complex having covered area of 120 acres and situated near Goth Abbas (Haji Shah Baig), Mouza Kund, U.C. Gadani, Sub District (Tehsil) Gadani, District Lasbela, Balochistan. The proposed project site is situated at ~16km in Southwest of Hub Chawki and can be accessed through Hub Chawki- Arabian Sea Road from main Hub City and another access route situated in Southwest of project area connects to Goth Mubarak Road and onwards to Karachi.

The proposed plant site is to be located in an area which is devoid of any biodiversity including forestry, wildlife, migratory birds, game reserves (flora and fauna), or protected species of fauna & flora; fishery or aquatic biology; watershed. There is no cultural or any other heritage sites in the project area. There are no scientific institutions anywhere in the project jurisdiction.

The proposed location was determined to be the most convenient location in proximity to the market and domestic supply chain.

Summarily, there are no / least environmental or social sensitivity factors within or nearby the project area. These factors are strongly supportive of the proposed project site.

The site has proximity to Hub Chawki- Arabian Sea Road from main Hub City, and another road to Karachi which connects major area to the rest of the country. These factors are also very much supportive of the project at the proposed site.

4.3 Technology Alternatives Options

The technology being offered by Volkswagen Company is considered to be "State of the art" in terms of being environment friendly, energy efficiency and modern plant & process design for similar capacity vehicle assembly plants.

The new plant will be built according to the applicable Best Available Technologies (BAT) defined for similar industry.

In general, automotive production involves pressing of metal sheets which undergo into welding process for the progression of structure. The unpainted vehicle body is assembled from formed body panels joined by welding, glue and riveting. Installation of engine and other parts with various stages gets the vehicle into final phase.

Depending on the proposed project requirements, the under-listed major categories of automotive processes/units are considered as possible alternatives for meeting any of these specific goals in line with the production processes and design of the proposed automotive plant.

Processing units are offered by many Licensors and each provides a unique technology. The design objective for such a product processing unit is to select individual licensed technologies that complement each other to obtain the required process and final product. In regard to their respective performance, each licensed technology is contemporary and therefore satisfies current HSE standards and meets Best Available Technology (BAT). The Premier Motors Automotive complex will mainly comprise the followings

- Press Shop;
- Body shop;
- Paint Shop;
- Assembly Shop;
- Performance Inspection & Test Track;

Other auxiliary supporting units and utility systems includes the followings;

- Water supply system and consumption;
- Wastewater Treatment Plant;
- Electrical system;
- Multi-Energy Absorption Chillers/Pumps;
- Container Yard;
- Scrap Yard;
- Ware House;
- Control room-process, control instrumentation;
- Building such as offices, laboratory, warehouse, workshops, shift worker's apartment, canteen and dispensary;
- HFO power plant;
- Reverse Osmosis;
- SNG (Synthetic Natural Gas);
- Multi-faith Prayer Room;

The produced vehicles shall be designed to meet the statutory requirements and technical requirements of EURO-3 & EURO-4 specifications.

The major categories of production processes have been globally accepted for an environment friendly operation of automotive plant.

Press Shop

According to the characteristics of raw materials and product plan, Premier Motors Limited prefers the clean and environmental friendly technology for the Press Shop. The door panels, roof, boot lid etc are typically pressed in to form the basic structure of the automobile with proper ventilation system and all measures will be taken to minimize the environmental pollution level.

Body Shop

To select the best alternative of body shop, mostly work is mechanized with latest technology. The pressed parts undergo into welding process for the progression of initial structure. This is

the joining platform unit of the underbody front & rear or in some cases the entire underbody can be a single pressed unit.

In stages, the side panels, the roof are then welded to the underbody and the automobile begins to take its shape. The welding process mostly done by robots and, wherein all multi axis robotic arms work in unison and utmost precision.

The shell of the automobile assembled in this section of the process lends itself to the use of robots because articulating arms can easily introduce various component braces and panels and perform a high number of weld operations in a time frame and with a degree of accuracy no human workers could ever approach. Robots can pick and load heavy roof panels and place them precisely in the proper weld position with great perfection. Moreover, robots can also tolerate the smoke, weld flashes, and gases created during this phase of production. As the body moves from the isolated weld area of the assembly line, subsequent body components including fully assembled doors, deck lids, hood panel, fenders, trunk lid, and bumper reinforcements are installed.

Paint Shop

Volkswagen state-of-the-art technology shall be used for the paint shop. The painting process is one of the most complex and cleanest of process. The vehicle passes by conveyor to the paint shop and the various sub-process include the following

- Pre-treatment (degreasing and anti-corrosion inhibitor)
- Sealant
- Paint Booth
- Oven
- Wax Booths Polishing

Assembly Shop

The assembly process consists of trim line, chassis line and final line and generally work carry out in parallel progression. The Sequence of production of the Engine closely follows the Production of the Vehicle Body and that of the TransAxle closely follows the sequence of engine production. Most of the component of the car like windshields, trims, steering column, electronics and other necessaries get assembled into the painted body.

4.4 Construction Technology Alternatives

The proposed project site is not exposed to any natural hazards. In this respect, concrete construction will be applied in the foundation. Construction would be RCC (reinforced cement concrete) as well as PEB (Pre-Engineering Building).

A thorough investigation of construction technology options will therefore depend on sound engineering design as well as field investigations (such as weather, climate, soil bearing capacity, the availability of construction materials locally and local labor skills). During the design phase, the Project Contractor will choose the construction technology which best meets project schedule, safety, and quality as well as the economic benefit to the local community.

5 Environmental & Social Baseline

This chapter defines the prevailing environmental and socio-economic conditions of the project area and surroundings. The project area in this document is defined as the area where the project related activities to be carried out which include the proposed project site and surroundings and the area that can interact with the project's positive and negative externalities in the long run.

The project area is defined as 'the areas where the project related activities to be carried, include the proposed project site and surroundings and the areas that can interact with various aspects of the project. The proposed project site with its surrounding area is defined as Project Study Area for baseline development. The study area map is presented in **Figure 5.1.**

The environmental impact of any activity or process will be assessed based on a deviation from the baseline or normal situations. Followings are the main components of the baseline discussed in this section.

- Physical Environment
- Biological Environment
- Socio-economic Environment

The description provided in this section is based on followings:

- Desk-top surveys and literature review.
- Field surveys: Baseline data gathered from field activities.
- Meetings and data collection from the proponent.
- Existing information sources and purchased data such as metrological data of the project area.
- Government released publications such as Provincial Census reports.
- Meetings and data gathering from various organisations and villages including:
- Environmental Protection Agency Hub, Balochistan
- Wildlife Department Hub & Lasbela, Balochistan

- Forest Department Hub & Lasbela, Balochistan
- Lasbela University Uthal, Balochistan
- Non-Governmental Organizations (NGO's)
- Health Department District Lasbela, Balochistan
- Local Communities

5.1 Physical Environment

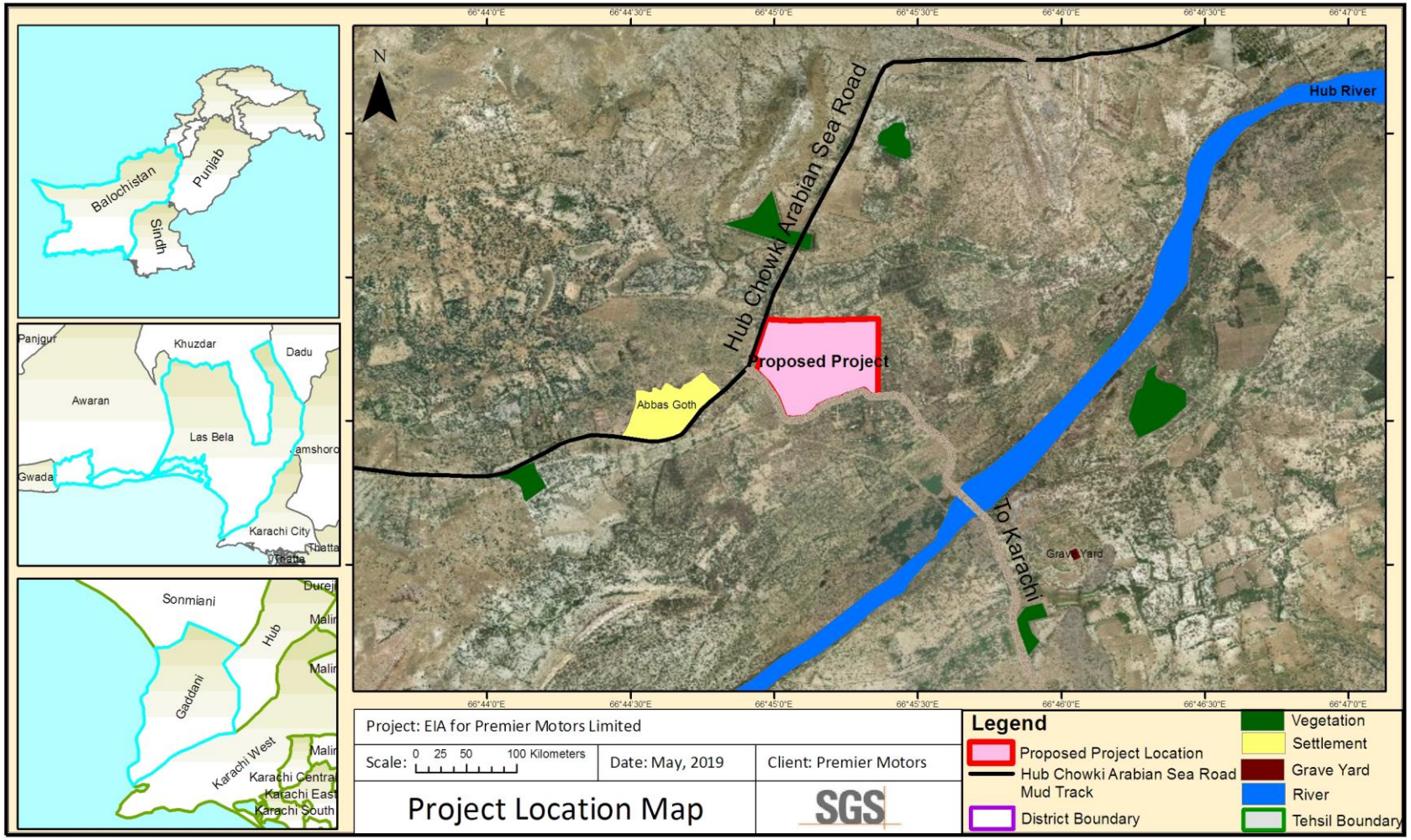
This part examines the physical resources such as physical features, topography, soil, climate, surface and ground water resources and quality, ambient air quality and geology of not only the project site but also the related project area to assess whether the project under assessment can or does have any impacts on any of these parameters. The main district is Lasbela which is in bordered to the north by the District 'Khuzdar', on the east by the Province of Sindh, on the south by the Arabian Sea, to the west by the District 'Gwadar' and towards the north-west by the District 'Awaran'. Lasbela is administratively subdivided into five tehsils, which are Bela, Dureji, Hub, Gadani and Uthal. Uthal is the District's headquarter, where all the major government offices are located.

The description of physical environment of Lasbela District and the project site is presented in the following sub sections.

5.1.1 Geographical Location

The proposed project area lies Mouza Kund, U.C Gadani, Sub District (Tehsil) Gadani, District Lasbela, Balochistan. Major features of proposed project location include; to north west side of proposed project's is Hub Chawki-Arabian Sea Road, on north east side & south east side is barren land, on the south west ~600m, Goth Abbas (Haji Shah Baig) is located. The Hub River is approximately 03 km away in east of project area. The proposed project site is situated at ~16km in South-West of Hub Chawki and can be accessed through Hub Chawki-Arabian Sea Road from main Hub City and another access route situated in South-West of project area which connects to Goth Mubarak road and onwards to Karachi. The proposed project area is given in in **Figure 5.1.**

Figure 5-1:The Study Area Map

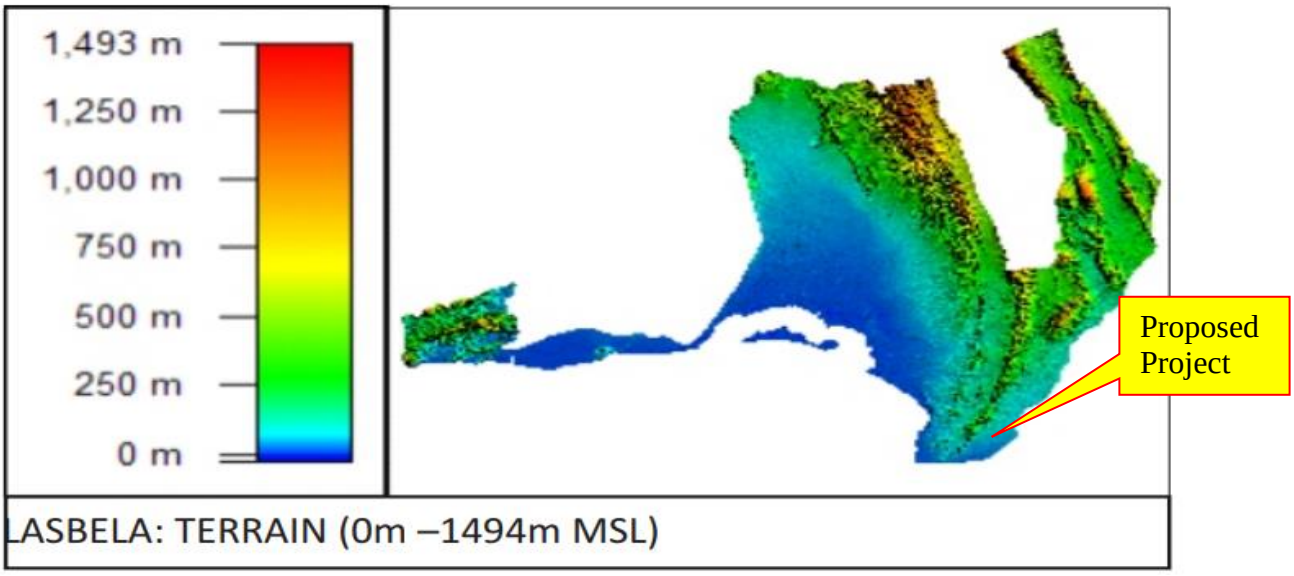


5.1.2 Topography

The landscape of the district is predominantly a vast sandy plain regularly interrupted by hilly areas. Lasbela lies on the southern coast of the Arabian Sea and the coastal belt is characterized by many bays and creeks with shallow water. Many small towns and hamlets (mostly fishermen settlement) are the main features of the district. The district Lasbela is situated between 24°-54' to 26°-37' north latitude and 64°-02' to 67°-28'. The project area may be classified as gently plain low relief area, having elevation varies from 30 feet (9.144m) to 45 feet (13.716m) from the mean sea levels. General topographic view of project area is given is **Figure 5.2** and district elevation is shown in **Figure 5.3.**

Figure 5-2: General Topographic View of Project Area

Figure 5-3: General Elevation of District Lasbela



5.1.3 Geology

The geological setting of the Lasbela district is related to two major orogenies. The earlier relates to the breakup of the super continental Gondwanaland during late Triassic- Jurassic period (Powell, 1979; Lydon, 1990,). The proposed project area is located in the gently plain low relief area in Gadani. In the macroenvironment, The rocks encountered are mainly sandstone, siltstone and shale with traces of limestone. The surrounding area is dotted by a number of small outcrops of mélange and quatemary deposits of silt, sand, gravels, conglomerate and bolders. The surrounding outcrops exposed in the form of amll hillock ridges. It appears that the hillock may represent a small part of denuded. In the surrounding of the area igneous intrusive rocks are also present, evidence is the rati hill having grantle dominant.

The oldest formation in the is Parth formation of the age of cretaceous, which is overlain by Pub formation of the age of Paleocene and Nari formation of Oligocene age. Parth formation is rich in foraminifers. It is a hard, light grey, white, cream, olive green, thin to medium bedded. Pab formation typically consists of quartzose sandstone which is white, cream, weathers yellow brown, medium to coarsde garined, thick bedded to massive. Nari formation is mostly composed of hard, compact, thick to thin bedded clayey limestone and mari with intercalation of shales.

The soil of area is alluvial, composed of light loose clay and mixed with fine sand. Some parts of the district possess saline ingredients with harder surface soils while few parts soil is in the form of fine dust. At the head of the valley above Bela, there are numerous streams and water courses. The best soil is a light loam mixed with a moderate amount of sand, known as cultivators's milk. Soil with slay surface with comparatively larger amount of sand is called awari which is second to milk. Both types of soils are present in the Lasbela district.

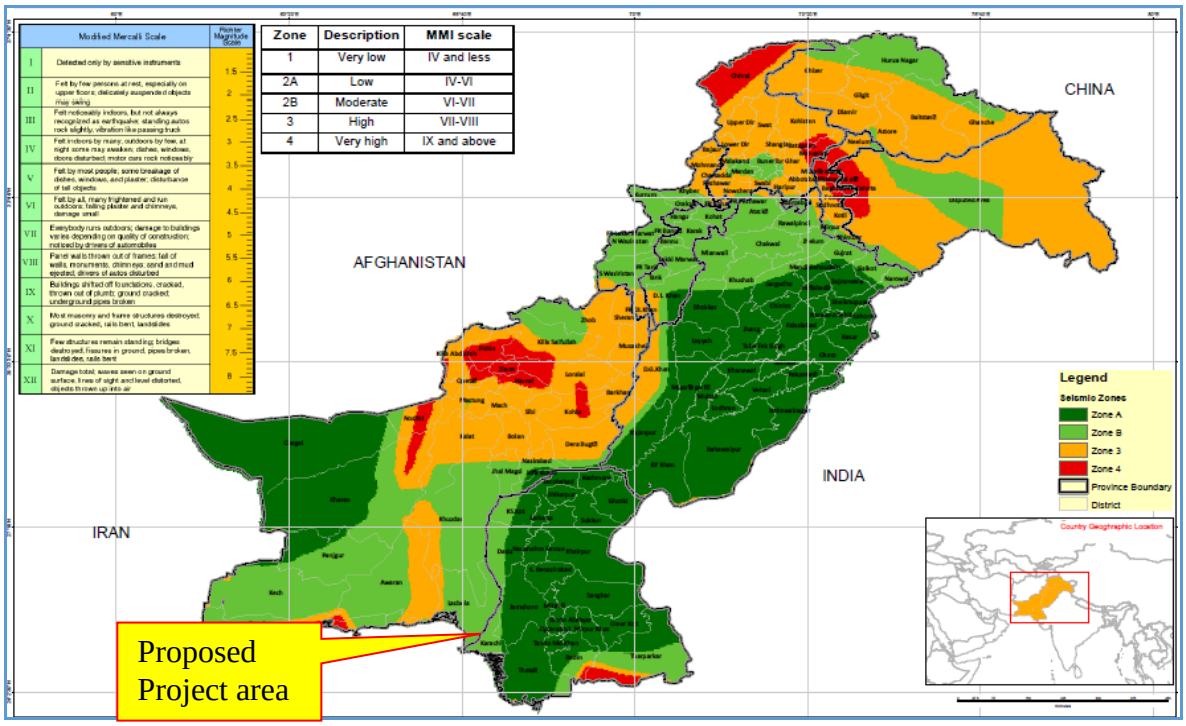
Beach material in Hub is composed of medium and fine sand with some stones. The soil of Lasbela up to Miani Hor Lagoon is alluvial, and is composed of light loose clay, mixed with fine sand with saline ingredients. The main minerals in the district are shale, marble, lime stone, barite and serpentine while basalt and magnesium are also found in the district.

5.1.4 Seismicity

Pakistan is located in the Indus-Tsangpo Suture Zone, which is roughly 200 km north of the Himalaya Front and is defined by an exposed ophiolite chain along its southern margin. This region has the highest rates of seismicity and largest earthquakes in the Himalaya region, caused mainly by movement on thrust faults.

According to seismic zones of Pakistan developed by Geological Center Quetta, the project area falls under category 2B of minor to moderate damage seismic activity. The seismic zoning map is shown in **Figure 5.4.**

Figure 5-4: Seismic Zoning Map



5.1.5 Hydrology

Arabian sea lies at a distance of ~10km in south-west of the project area. Drainage pattern of the project area is parallel to sub-parallel which is considered a pattern of rivers causes by minor slopes with some relief. All drainage lines are representing the ephemeral small wide gales and rills, which become active in the rainy season.

It is expected that the aquifer in the area will be in sandstone of Nari formation containing brackish water, used locally for washing and cleaning purposes. Presence of brackish water

can be attributed by marine water encroachment in the subsoil or substratum of bed rock of the area.

A. Surface Water

The nearest fresh surface water resource is Hub river situated at around ~02km in east of project area which has a very nominal flow and is dry for most parts of the year. The canals originated from Hub river are also dried and no fresh water available in the ~05km vicinity of project area. Major surface fresh water source is Hub dam approximately 60 km away from the proposed project site. Hub river delta is infested with sea water due to virtually no flow of water from upstream. SGS Pakistan Team has collected water sample of Hub River and brought to laboratory for the physio-chemical analysis.

Figure 5-5: Hub River, District Lasbela, Balochistan


Dried condition of Hub River

Figure 5-6: Hub River Distributary Canals after Hub City, District Lasbela, Balochistan


Dried canals originated from Hub River situated after Hub City towards Winder via N25 road.

B. Groundwater

Aquifer Characteristics

A certain amount of water filters into the ground because of seepage from the canals and rainwater that has collected on the surface. This water drains downwards below the root zone and finally reaches a level at which every available crevice in the earth is filled with water. This area is known as the zone of saturation and the water found here is referred to as groundwater. The community does not prefer groundwater because of its salinity and usually ground water depth is 80 to 200 feet.

Aquifer Recharge

The sources of aquifer recharge are:

- Rainwater percolation.
- The Hub River, which is the primary source of recharge in the area
- Seepage & Leaching of irrigation water from canals

Groundwater Table

The project area predominantly barren. This part of desert area, owing to low rainfalls, high runoff potential and high evaporation rates has limited supply of fresh groundwater. Moreover, the ground water is highly saline due to its existence in proximity of Arabian sea. The ground water is only used for certain domestic purposes other than drinking. Drinking water in the project area is supplied through water tankers. This fresh water is supplied from Hub dam fresh water source. In the desert the thin fresh water lenses and perched fresh water aquifers are also a source of water supply. Precipitation being low in the area does not significantly affect the water table. It only benefits the desert dwellers, where rainwater on a limited scale temporarily fills the Tars or Tals and recharges the dug wells, only to sustain their demands for a limited period of time. Water is extracted through pumps or dug wells (open wells excavated in low lying depressions).

The water table of project area lies at a depth of about 80 to 200 feet. The only source of water for livestock is derived from dugout/natural ponds, in which the water is stored during monsoon season.

Figure 5-7: Ground Water Wells, District Lasbela, Balochistan

	
Ground Water Well (Solar Energy Pump) in Goth Abbas near Project area	Open well excavated in low lying depressions

Water Quality

Water quality analysis were carried out in the project area as part of the EIA study. For this purpose, 04 water samples were taken from various sources being used by residents for different purposes. These sources include, one Hub river, two ground water and one drinking water (tanker water). Around 25 parameters were analyzed in ground water and surface water sample and thereafter compared with National Standards for Drinking Water Quality (NSDWQ). All these parameters of water play an important role, especially in determining its quality and suitability for applications.

At present, sources of water contamination are very common, mainly caused by disposal of domestic and livestock wastes by local communities. Analysis of some criteria pollutants including heavy metals was conducted to determine their extent in water samples.

The lab results depicted in Table 5.1 & Table 5.2 show that for Goth Abbas ground water sample, the parameters of chloride and Hardness are exceeding the limits regulated by NSDWQ.

- **pH:** pH determines the acidic or basic character of water system and is a vital parameter on which life of many terrestrial depends, from micro to macro and even soil matrix of environment which grows diverse food for all terrestrial communities including human. pH monitoring pattern on collected water samples indicates that the values of pH in samples were found in the range of 7.24 to 7.80.
- **TDS:** Total dissolved salts in water make up the TDS which essentially consisting of major anions & major cations in association with such minor portion of anions &

cations which are present in trace or minor levels. TDS indicates total ionic contents which are soluble in water and are estimated by multiplying E. Conductivity by a factor ranges from 0.55 till 0.70. TDS was recorded high in all samples, 8572 mg/L in well water (S1), 6732 mg/L in ground water (S3), 3422 mg/L in Hub River (S4) & 2888 mg/L in tanker sample (S2).

- **Alkalinity / Hardness:** Large scale distribution of alkaline earth metals mainly Calcium & Magnesium causes to develop alkalinity & hardness in any aquatic system, induced mainly from lime stone, Calcite & Dolomite minerals which forming the major part of minerals on earth crust and are simultaneously interfacing with water & CO2 in the air eco-system, below and above the lithospheric surface.

  Bi-carbonate alkalinity which is the major part of alkaline character is induced to aquatic system through below depicted well known environmental reaction:

$$CaCO_3 + CO_2 + H_2O \longrightarrow Ca(HCO_3)^2$$

  Whereas Carbonate & Hydroxide alkalinities are rarely encountered in eco-friendly water system, these alkalinities develop at pH figures lingering at or above 8.30. Hardness, too, develops due to aforementioned reaction referred to as carbonate & non-carbonate hardness.

  Total hardness concentrations were 2323.35mg/l in well water (S-1), 774.56 mg/l in tanker water (S-2), 1752.02 mg/l in ground water (S-3) & 762.97 mg/l in Hub River Surface water

- **Chloride:** Chloride is regarded among major anionic components and is major part of any aquatic system. Chloride mainly induced from natural derived Sodium chloride as major component but its concentration is restricted for drinking applications. Low to moderate concentrations of both chloride ions add palatability to water. In fact, it is desirable for this reason. Chloride can also pose special problems in the conditioning of water. Analyses pattern of chloride on water samples indicate that 3338.43mg/l in ground water sample (S-1), 1107.04 mg/l in sample (S-2), 2745.64 mg/l in sample (S-3) and 1245.42 mg/l in sample (S-4).

- **Iron, Manganese, Zinc:** Heavy metals including Mn, Zn, As, Ba and etc are also regarded significant pollutants in water environment. The recorded heavy metals in all the collected samples are considerable low.

Conclusion: Chemical and physical analyses pattern carried out on all the collected samples indicating the most water samples are complying NEQS regulated guidelines on drinking water from drinking point of view. All the recorded values of the parameters are within the standard values. Heavy metal contaminants such as arsenic, mercury, manganese and zinc are too low to cause any sort of environmental damage to these water sources. So, it is concluded that ground water of this area is good for drinking purposes.

Figure 5-8: Ground Water & Surface Water Sampling

	
Well Water (Ground Water) Sample in ~4km north of the project area – Sample # 01	
Latitude: 25º 0' 7.729"	Longitude: 66º 49' 24.67"
	
Tanker Water (Drinking Water) sample nearby project area – Sample # 02	
Latitude: 24º 56' 57.130"	Longitude: 66º 44' 40.51"
	
Ground Water Sample in Goth Abbas near project area – Sample # 03	
Latitude: 24º 57' 16.220"	Longitude: 66º 44' 27.209"
	
Surface Water Sample from Hub River, near Hub city – Sample # 04	
Latitude: 25º 0' 44.039"	Longitude: 66º 53' 17.369"

Table 5-1: Chemical Analysis of Surface & Ground Water

Sr. #	*Parameters*	*Method*	*Unit*	*LDL*	*Well Water Sample #01*	*Drinking Water Tanker Sample # 02*	*National Standards*
1.	pH at 25 °C	APHA-4500H+ B	-	-	7.80	7.53	6.5-8.5
2.	Colour	APHA 2120 C	Pt-Co	-	16	18	≤15
3.	Fluoride	APHA 4500F-C	mg/L	0.05	1.232	0.641	≤1.5
4.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	5.0	8572	2888	<1000
5.	Nitrite	APHA 4500NO_2 B	mg/L	0.003	<0.003	<0.003	≤3
6.	Chloride (Cl-)	APHA-4500Cl B	mg/L	0.5	3338.43	1107.04	250
7.	Zinc (Zn)	APHA-3120 A	mg/L	0.005	<0.005	<0.005	5.0
8.	Cyanide	APHA 4500CN F	mg/L	0.05	<0.01	<0.05	≤0.05
9.	Phenols	APHA 5530D	mg/L	0.1	<0.002	<0.002	≤0.002
10.	Chlorine	APHA 4500Cl B/C	mg/L	1.0	<0.02	<0.02	0.5-1.5
11.	Hardness Total as CaCO3	APHA-2340 C	mg/L	1.0	2323.35	774.56	-
12.	Cadmium (Cd)	APHA 3120 B	mg/L	0.003	<0.003	<0.003	0.01
13.	Copper (Cu)	APHA 3120 B	mg/L	0.005	<0.005	0.007	2
14.	Lead (Pb)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	≤0.05
15.	Nickel (Ni)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	≤0.02
16.	Manganese (Mn)	APHA 3120 B	mg/L	0.005	0.007	0.011	≤0.5
17.	Aluminium (Al)	APHA 3120 B	mg/L	0.005	0.264	0.026	≤0.2
18.	Antimony (Sb)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	≤0.005
19.	Arsenic (As)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	≤0.05
20.	Barium (Ba)	APHA 3120 B	mg/L	0.005	0.031	0.048	0.7
21.	Boron (B)	APHA 3120 B	mg/L	0.005	1.898	0.575	0.3
22.	Selenium (Se)	APHA 3120 B	mg/L	0.005	0.016	0.023	0.01
23.	Mercury (Hg)	APHA 3112 B	mg/L	0.001	<0.001	<0.001	≤0.001
24.	Chromium (Cr)	APHA 3111 B	mg/L	0.005	<0.005	<0.005	≤0.05
25.	Nitrate	APHA 4500 NO_3 B	mg/L	0.003	15.040	0.500	≤50

Table 5-2: Chemical Analysis of Surface & Ground Water

Sr. #	*Parameters*	*Method*	*Unit*	*LDL*	*Goth Abbas Ground Water Sample # 03*	*Hub River Surface Water Sample # 04*	*National Standards*
	pH at 25 °C	APHA-4500H+ B	-	-	7.24	7.79	6.5-8.5
1.	Colour	APHA 2120 C	Pt-Co	-	Colourless	Colourless	≤15
2.	Fluoride	APHA 4500F-C	mg/L	0.05	0.934	0.688	≤1.5
3.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	5.0	6732	3422	<1000
4.	Nitrite	APHA 4500NO_2 B	mg/L	0.003	<0.003	<0.003	≤3
5.	Chloride (Cl-)	APHA-4500Cl B	mg/L	0.5	2754.64	1245.42	250
6.	Zinc (Zn)	APHA-3120 A	mg/L	0.005	<0.005	<0.005	5.0
7.	Cyanide	APHA 4500CN F	mg/L	0.05	<00.01	<00.01	≤0.05
8.	Phenols	APHA 5530D	mg/L	0.1	<0.002	<0.002	≤0.002
9.	Chlorine	APHA 4500Cl B/C	mg/L	00.02	<00.02	<00.02	0.5-1.5
10.	Hardness Total as CaCO3	APHA-2340 C	mg/L	1.0	1752.02	762.97	-
11.	Cadmium (Cd)	APHA 3120 B	mg/L	0.003	<0.003	<0.003	0.01
12.	Copper (Cu)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	2
13.	Lead (Pb)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	≤0.05
14.	Nickel (Ni)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	≤0.02
15.	Manganese (Mn)	APHA 3120 B	mg/L	0.005	0.009	<0.005	≤0.5
16.	Aluminium (Al)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	≤0.2
17.	Antimony (Sb)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	≤0.005
18.	Arsenic (As)	APHA 3120 B	mg/L	0.005	<0.005	<0.005	≤0.05
19.	Barium (Ba)	APHA 3120 B	mg/L	0.005	0.026	0.039	0.7
20.	Boron (B)	APHA 3120 B	mg/L	0.005	0.730	1.005	0.3
21.	Selenium (Se)	APHA 3120 B	mg/L	0.005	0.027	0.031	0.01
22.	Mercury (Hg)	APHA 3112 B	mg/L	0.001	<0.001	<0.001	≤0.001
23.	Chromium (Cr)	APHA 3111 B	mg/L	0.005	<0.005	<0.005	≤0.05
24.	Nitrate	APHA 4500 NO_3 B	mg/L	0.003	0.500	0.600	≤50

5.1.6 Climatology and Meteorology

The climate of the district Lasbela is dry and temperate in most parts and humid in the coastal areas. Except for the peak summer months, which are very hot, there is not much variation in climate in the remaining months of the year. The daylight hours are long and solar radiation is very high, indicating strong potential for generation of solar energy.

The summer from March to September is very hot. The winter from mid-November to end of January is sufficiently cold. The spring commences from early February and continues till mid of March. When the temperature starts raising rapidly, the monsoon usually breaks during July and August, when moderate showers of rain are received. The average temperature ranges from 3ºC minimum to 17ºC maximum in January and 24ºC to 49ºC in June.

Rainfall is low and unreliable with periodic droughts for short and long periods, which negatively affects natural resources and livelihoods. Average total annual rainfall is around 30 cm, most of which is during the monsoon season.

Observatory of the Pakistan Meteorological Department (PMD) near project location are Lasbela (Balochistan) and Karachi (Sindh)

Table 5-3: Yearly Mean Maximum & Minimum Temperatures and Precipitation Data District Lasbela Observatory (2018-2014)

Parameters	Mean Temperature (ºC)		Precipitation (mm)
	Maximum	Minumum	
2018	48.0	3.0	35.0
2017	49.0	4.0	22.0
2016	47.0	7.0	29.0
2015	47.0	2.0	28.0
2014	48.0	-1.0	33.0

Source: Report Climate of Pakistan, National Drought Monitoring Centre (NDMC) Pakistan Meteorological Department (2017-2013)

Table 5-4: Yearly Mean Maximum & Minimum Temperatures and Precipitation Data Karachi Observatory (2018-2014)

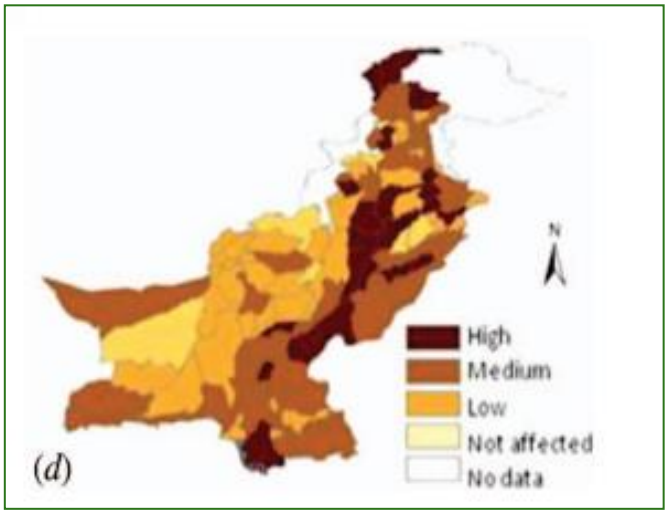
Parameters	Mean Temperature (ºC)		Precipitation (mm)
	Maximum	Minumum	
2018	45.0	8.0	1.0
2017	42.0	8.0	36.0
2016	41.0	10.0	42.0
2015	45.0	9.0	28.0
2014	41.0	6.0	11.0

Source: Report Climate of Pakistan, National Drought Monitoring Centre (NDMC) Pakistan Meteorological Department (2017-2013)

5.1.7 Natural Disasters

Pakistan is situated within a hazard-prone region and is exposed to a variety of natural disasters such as floods, cyclones, earthquakes, landslides and droughts. A natural disaster can cause loss of life or property damage, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover. The burden of natural disasters in Pakistan can be underlined by the fact that they have been responsible for the deaths of 6037 people in the period from 1993 to 2002, with a further 8.9 million people were also affected (World Disasters Report 2003). More than 80,000 people died and 3.5 million lost their homes in a single event: the earthquake of 8th October 2005 and floods in 2010.

Floods



Data from three different sources have been combined by means of GIS: (1) a flood distribution map for Pakistan from the WMO, (2) the most flood prone districts, as investigated by the PMD, (3) those districts that are most likely to be affected, as indicated by the Federal Flood Commission of Pakistan. These were used to derive flood hazard rankings for the individual districts of Pakistan as shown in Figure d. Districts located along rivers and commonly affected by seasonal or flash floods are ranked highly, while those that are less flood hazards. Data from three different sources have been combined by means of GIS: (1) a flood distribution map for Pakistan from the WMO, (2) the most flood prone districts, as investigated by the PMD, (3) those districts that are most commonly affected are ascribed a medium rank. Those districts rarely affected by floods are ascribed a low rank and those never affected by floods are described as 'not affected'.

It was concluded from the primary stakeholder consultation and past flood data review that the project area falls under low probability range.

5.1.8 Ambient Air Quality

Troposphere air is highly susceptible to hostile anthropogenic activities taking place at ground level or in vicinity of ground; which are mainly caused by fossil fuel combustion in industrial units and caused by high density transportation through mobile & immobile vehicles. Degradation of fossil fuel under the impact of high temperature give rise to varying gaseous products composed mainly of CO_2 in association with small amounts of Particulates, CO, NO_2 and SO_2 etc. These pollutant gases change the ambient concentration of air environment and could cause sufficient damage to ground level air ecology.

Ambient air quality is measured with monitoring devices that have the capability to capture & analyse criteria air borne pollutants including CO, NO, NO_2, SO_2, TSP, PM_{10}, $PM_{2.5}$, O_3

& Lead (Pb) at micro levels. The monitoring techniques of each of these pollutant gases based on USEPA defined standard methods depicted in **Table 5-5.**

Table 5-5: Ambient Air Monitoring Methodology

Air Pollutant	*Monitoring Technique*	*Reference Method*	*Measurement Range*	*Lowest Detection Limit*
Carbon Monoxide (CO)	Gas Filter Correlation CO Analyzer	US EPA Designated Method RFCA-0981-054	0 – 100 mg/m^3	0.01 mg/m^3
Sulfur Dioxide (SO_2)	Pulsed Fluorescent Analyzer	US EPA Designated Method EQSA-0486-060	0 – 50 µg/m^3 0 – 100 mg/m^3	0.01 µg/m^3
Nitrogen Dioxide (NO_2)	Chemiluminescent Analyzer	US EPA Designated Method RFNA-1289-074	0 – 50 µg/m^3 0 – 100 mg/m^3	0.01 µg/m^3
Nitrogen Dioxide (NO)	Chemiluminescent Analyzer	US EPA Designated Method RFNA-1289-074	0 – 50 µg/m^3 0 – 100 mg/m^3	0.01 µg/m^3
Total Suspended Particulate (TSP)	High Volume PM10 Sampler	40 CFR 50, Appendix J (US EPA)	2 – 750 µg/m^3	2 µg/m^3
Particulate Matter (PM_{10})	High Volume PM10 Sampler	40 CFR 50, Appendix J (US EPA)	2 – 750 µg/m^3	2 µg/m^3
Particulate Matter ($PM_{2.5}$)	High Volume PM10 Sampler	40 CFR 50, Appendix J (US EPA)	2 – 750 µg/m^3	2 µg/m^3
Ozone (O_3)	EN50270:1999	Electro chemical	2-500 µg/m^3	2 µg/m^3
Lead (Pb)	Radiello tubes	JIS B 9921:2010/ISO 2150-4:2007	-	-

NEQS for air quality standards have been introduced in Pakistan since 2010; therefore, the monitoring values of Carbon monoxide (CO), Sulphur dioxide (SO_2), Nitrogen Oxides (NO_x), Particulate Matter (TSP, PM_{10} & $PM_{2.5}$), Ozone (O3) & Lead (Pb) were compared with standards set by NEQS.

The proposed project site located in open and surrounded by barren area. The only sources of air pollutants are from traffic load on hub chawki to arabian sea road in northwest side of project area. There is no source of pollution found in the East of project area. Ambient air quality was monitored (08 hours) at project area. The meteorological conditions were also monitored with the help of meteorological station installed for 08 hrs to assess the trend of air movements.

08 hours Air monitoring of CO was found below the national environmental quality (NEQs) level and it was well complying NEQS guideline limit of 5.00 mg/m^3 regulated at

8 hours monitoring. Air monitoring pattern on NO & NO_2 indicates that it was below the limit as per below mentioned table **(Table 5-6)** and comply with NEQS, 2010. Air monitoring pattern on SO_2 indicates that it was below the limit as per below mentioned table **(Table 5-6)** and comply with NEQS, 2010. Air monitoring pattern on particulate matter (TSP, PM_{10} & $PM_{2.5}$) indicates that it was below the limit as per below mentioned table **(Table 5-6)** and comply with NEQS,2010. Similarly, Ozone (O_3) and Lead (Pb) concentration were also found within the NEQS limits.

Overall all the parameters were found below the limits regulated by NEQS, 2010 for ambient air whereas Particulate Matter (PM_{10}) was recorded 111 µg/m^3 near to limits as compared NEQS 150 µg/m^3. Summary of ambient air quality monitoring is presented in **Table 5-6.**

Table 5-6: Ambient Air Quality Results at the Project Proposed Site

Parameter	*Unit*	*LDL*	*Monitoring Results* *Proposed Project Site*	*Limits as Per NEQS*
Nitrogen Dioxide (NO_2)	(µg/ m^3)	0.01	0.1	80 (µg/ m^3)
Nitrogen Oxide (NO)	(µg/ m^3)	0.01	7.6	40 (µg/ m^3)
Sulfur Dioxide (SO_2)	(µg/ m^3)	0.01	1.6	120 (µg/ m^3)
Carbon Monoxide (CO)	(mg/m^3)	1.00	1.8	5 (mg/m^3) For 8 Hours
Total Suspended Particulate (TSP)	(µg/m^3)	2.00	153.7	500 µg/m^3
Particulate Matter (PM_{10})	(µg/m^3)	2.00	107.7	150 µg/m^3
Particulate Matter ($PM_{2.5}$)	(µg/m^3)	2.00	27.8	75 µg/m^3
Ozone (O_3)	(µg/m^3)	1.0	9.1	130 µg/m^3
Lead (Pb)	(µg/m^3)	1.0	<1.0	1.5 µg/m^3
NEQS = National Environmental Quality Standards				

Figure 5-9: Ambient Air Monitoring at Project Site

SGS Team conducted Ambient Air Monitoring at Proposed Project Site	
Latitude: 24º 57' 15.342"	Longitude: 66º 45' 4.640"

Table 5-7: Metrological Data (Project Site)

Time (Hrs)	Temperature °C	Wind Direction	Wind Speed m/s	Humidity %	Atmospheric Pressure (mmHg)
10:00	30.1	E	1.2	66.0	757.8
11:00	30.4	SE	0.6	62.0	757.9
12:00	31.5	E	2.1	57.0	757.4
13:00	31.0	E	1.3	60.0	756.4
14:00	30.4	SE	0.7	65.0	756.4
15:00	30.8	SE	1.3	62.0	755.4
16:00	30.2	SE	0.8	65.0	755.3
17:00	30.1	SE	1.0	63.0	756.6

5.1.9 Noise Quality

In the absence of any reliable and established noise data, noise level monitoring was conducted at the same location where ambient air quality was measured and its surrounding of project area. As per NEQS defined guidelines, the noise measurements were made at a height of 1.5 meters above the ground, and the LAeq was monitored at respective location. Noise measurements were carried out using a MASTECH sound level meter. The sound level meter was calibrated to ensure overall measurements are corrected and within the tolerance required by the standard. Noise monitoring results are presented in below **Table 5.8.**

During the project operation activities noise levels, should be monitored to assess the increase in noise levels with respect to the background noise levels.

Table 5-8: Results of Noise Monitoring at Project Site

Location	*Reading 1 Noise Level (dB)*	*Reading 2 Noise Level (dB)*	*Reading 3 Noise Level (dB)*	*NEQS*
Point # 01 - Project Site	63.20	63.40	63.90	75
Point # 02 - In Northwest of Project Site (near Hub Chawki – Arabian Sea road)	62.10	62.70	63.10	75
Point # 03 – In Southwest of Project Site (near road towards Karachi)	59.40	60.70	61.10	75
Point # 04 – In East of Project Site	64.50	63.20	62.10	75

Figure 5-10: Noise Quality Monitoring at Project Site

	
SGS Team conducted Noise Monitoring at Proposed Project Site	
Latitude: 24º 57' 15.342"	Longitude: 66º 45' 4.640"

5.1.10 Soil Quality

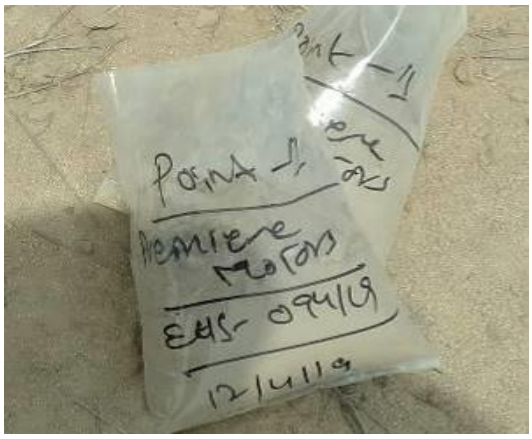
Soil sampling at advised two locations in the proposed project area was conducted in accordance with standard conditions, procedures and protocols. All samples were selected very carefully to assess the quality of soil in project area and related community:

1. SS-1 Project site (Mid)
2. SS-2 Project site (North side)

These soil samples were collected from 12 inches depth from soil cover. The chemical characteristics of the project area soil are presented in below **Table 5.9.**

Soil constitutes a vital environmental matrix and it is always significant part of baseline environmental studies relating to IEE/EIA/ESA. Physically, soil is composed of fundamental mineral induced particles referred to as sandy, silt, silica and gravel respectively; whereas chemically it is composed essentially of air, water, mineral matter and some organic matter. Diversity distributions of fundamental particles in soil determine the soil character. Soil is highly amenable to contamination of various types and degrees caused primarily by anthropogenic activities; whereas natural derived contaminations are from rare to none.

Figure 5-11: Soil Sampling at Project Site



SGS Team conducted Soil Sampling at Proposed Project Site

Table 5-9: Chemical Characteristic of Project Area Soil

Sr. #	*Parameters*	*Method*	*Unit*	*LDL*	*Test Results*	
					SS-1	*SS-2*
1	pH at 25ºC	USEPA-9045 C	-	-	8.08	8.08
2	Electrical conductivity	ISO-11265:1994	µs/cm	-	288.00	217.00
3	Oil and grease	Gravimetric	mg/kg	10.00	<10.00	<10.00
4	Chloride	USEPA3050B	mg/kg	00.50	107.26	83.18
5	Barium	USEPA3050B	mg/kg	00.50	34.69	33.68
6	Arsenic	USEPA3050B	mg/kg	00.50	7.25	6.10
7	Zinc	USEPA3050B	mg/kg	00.50	16.70	16.74
8	Cadmium	USEPA3050B	mg/kg	00.50	<0.050	<0.050
9	Chromium	USEPA3050B	mg/kg	00.50	13.10	13.84
10	Mercury	USEPA 74718	mg/kg	0.050	<0.050	<0.050
11	Silver	USEPA 3050B	mg/kg	00.50	<0.050	<0.050
12	Lead	USEPA 3050B	mg/kg	00.50	05.85	04.95
13	Selenium	USEPA 3050B	mg/kg	00.50	<00.50	<00.50

Most suspected monitoring parameters including pH, EC, Cl, Mg, Ba, Oil & Grease, and pollutant heavy metals including As, Cd, Cr, Se, Hg and Pb were monitored to determine the magnitude of these pollutants at project site, are discussed below.

- **pH** indicates acidic or alkaline character of soil. Soils below pH 6.7 are acidic and soils above pH 7.3 are alkaline. pH near 7.0 is considered neutral. Most crops grow best if the soil pH is between 6.0 and 7.5. Lime is most commonly used to raise soil pH levels. pH figures of 2 samples were found within the ranges 8.08 indicating all samples are slightly alkaline in nature.
- **Electrical Conductivity** determines extent of total soluble salts in soil was recorded 217.0 and 288.0 µS/cm in SS-1 & SS-2, respectively.
- **Oil & Grease** is the total Oil & Grease contents [Hydrocarbons & Non-Hydrocarbons (polar organic compounds)] obtained by extraction of n-hexane. These includes polar and non-polar hydrocarbons which all having boiling points greater than 85°C. These are also referred to as hexane extracted materials or HEM; Concentrations of Oil & Grease in the two collected soil samples were below the detection limits show that no contamination of oil & grease in the project soil.
- **Barium** Concentration was recorded between 34.69 & 33.68 mg/kg in the SS-1 & SS-2, respectively.
- **Arsenic** Concentrations in two samples were detected 7.25 & 6.10 mg/kg in the SS-1 & SS-2, respectively.
- **Zinc** Concentration in two samples were found in the range of 16.70 – 16.74 mg/kg.
- **Chromium** concentration in two samples found in the range of 13.10 - 13.84 mg/kg.

Conclusion: The analysis results of all soil samples indicate that the soil of project site is is found free from noxious pollutants that can cause any damage to soil cover of the project corridor. Organic pollutants including Oil & Grease compounds were found at levels below reporting limit; whereas inorganic pollutants including heavy metals were also registered at such reasonably low levels to cause any sort of environmental disturbance to soil environment of the project site.

5.2 Biological Environment

In this section, the baseline environmental conditions pertaining to biological environment are described. These conditions have subsequently been used to identify the potential impacts on the biological environment that are likely to arise from the project activities.

5.2.1 Biological Diversity

Ecological and wildlife expert conducted biological baseline study at project area in the month of April, 2019 to evaluate and observed ecology and wildlife of the project area. Project area is arid and barren with a uniform ecological units. Although presence of mountains and coastal environment makes it different when comparing it with rest of the district.

5.2.2 Floral Diversity

Biological diversity of project area, specifically flora of the microenvironment, is significantly governed by the edaphic factors like soil type i.e. whether is sandy, gravel or alkaline, the amount of moisture available and metrological conditions; we know foliage growth and propagation is the direct function of both soil and weather conditions. Since the proposed project site is part of the Lasbela district, hence, a glance at the general vegetation cover would help understand the over environment.

The major tree species found in the district are Pelu (*Salvadora oleoides),* Kandi *(Prosopis cineraria),* Ber (*Zizyphus nummularia),* Date Palm *(Phoenix dactylifera),* Gaz *(Tamarix sp.),* Kikar *(Acacia jacquemontii),* and Kotor *(Cadaba ferinosa).* The mangrove species are *Avicenia marina*, *Rhizophora mucronata* and *Ceriops tagal. Kandi (Prosopis spicigera)* is the Climax tree species of the region i.e. it has established itself over a course of ecological succession and competition with other plant species for survival.

The main shrubs are *Euphorbia cauduicifolia*, *Haloxylon sp.*, *Calligonum polygonoides*, Gugul (*Commiphora mukal*), Merin (*Heliotropium sp.*), Gujo *(Aerva javanica),* Aak *(Callotropis procera), Alhaji camelerom* and Mazri *(Nannorrhops ritchieana).*

The ground cover consists mainly of grasses like *Eliosine sp.*, *Lasiurus sp.*, *Chrysopogon sp.*, *Aristida sp.* and *Cymbopogon sp.*

Mesquite, an exotic species that is bushy in shape, has spread over large areas in the south-eastern parts of the district. These plants are exceptions in the prevailing barren landscape.

Mesquite is generally considered a weed, but in arid and semiarid areas of Balochistan province, it is considered a salvation plant.

There is a very limited area being cultivated which is only dependent on the seasonal rainfall. Quite a considerable area could be brought under cultivation provided water sources are developed for irrigation, although this too, is an optimistic estimate.

Forests are vital for the environmental and for maintaining the ecological balance. They play an important role in the supply of wood and non-wood products including water, grazing land, medicinal and aromatic plants maintaining of watersheds, wildlife habitats for a number of wildlife species including animals and plants, control of erosion and conservation of soils, sequestration of carbon and provision of countryside recreation and ecotourism.

Generally, the terrestrial vegetation of project area is scanty and consists of xerophytes including the thorny *Euphorbia Nerifolia*, *Caragana Polyacantha*, and *Convolvulus Spinosus*.

Predominant bush species found in the area is Devi (Mesquite or the *Prosopis Juliflora*). In the immediate vicinity of the project area, older plants are cut by the local population to cater for their fuelwood requirements. Mesquite wood is also used for preparation of charcoal which is a significant source of livelihood of the stakeholders. The existing vegetation cover, although in a very scanty shape, provides share and fuel wood to the local population. The wild grass is the only source of food for the livestock. The dry weather conditions do not allow the project area and its outskirts to present a fascinating greenish look.

The natural vegetation of Baluchistan coastal region is composed of Xeromorphis and is able to survive in arid climate. The coastal vegetation not only suffers from drought climatic conditions but also through strong wind erosion.

As far as microenvironment is concern the project area lies in an arid zone, therefore, sweet water is scarce throughout project corridor. Drought reoccurs and usually there is no rain every third year. The soil is generally infertile and is considerably susceptible to wind erosion. The project area is totally barren and merely covered with *Prosopis Juliflora* and does not lie inside any notified forest and protected areas.

Figure 5-12: Photographs of Flora at Project Site

Prosopis Juliflora at Proposed Project Site

Methodology

The project area was thoroughly surveyed & investigated intermittently to study the botanical and ecological conditions. It provides an opportunity to make plant collections and field observations during the flowering and fruiting seasons for a maximum number of plant species. The area was sampled by quadrat method. Random stratified sampling was done using 20' x 20' quadrat and in each community 5 to 10 quadrats were taken. Frequency and cover of each species were noted. The quadrats were laid down at regular intervals of 10 steps. Plants from each quadrat were collected and associate species even not present in the quadrats were also noted down and collected.

Specimens were identified using available literatures and by comparison of the collections with specimens. Nomenclature followed here is that from Flora of Pakistan (Nasir & Ali, 1972–1994) and (Ali & Qaiser, 1995-2008).

Table 5-10: Common Floral Species of District Lasbela

Species	Life Form	Abundance
Acanthaceae		
Barleria acanthoides	*Chaemophyte*	V. common
Blepharis sindica	*Chaemophyte*	V. common
Aizoaceae		
Corbichonia decumbens	*Therophyte*	Common
Apocynaceae		
Rhazya stricta	*Phanerophyte*	Common

Species	Life Form	Abundance
Asteraceae		
Echinops echinatus	*Chaemophyte*	V. common
Launaea procumbens		
Vernonia cinerascens	*Chaemophyte*	Common
Asclepiadaceae		
Calotropis procera	*Phanerophyte*	Common
Periploca aphylla	*Phanerophyte*	Common
Boraginaceae		
Heliotropium ophioglossum	*Chaemophyte*	Common
Trichodesma indicum	*Chaemophyte*	Common
Burseraceae		
Commiphora wightii	*Phanerophyte*	common
Caesalpiniaceae		
Cassia holosericea	*Chaemophyte*	V. common
Capparidaceae		
Capparis decidua	*Phanerophyte*	V. common
Cleome scaposa	*Therophyte*	Common
Cleome viscosa	*Therophyte*	Common
Celastraceae		
Maytenus senegalensis	*Chaemophyte*	Common
Convolvulaceae		
Cressa cretica L.	*Chaemophyte*	V. common
Convolvulus spinosus	*Chaemophyte*	Common
Euphorbiaceae		
Euphorbia caducifolia	*Therophyte*	Common
Malvaceae		
Hibiscus micranthus	*Chaemophyte*	Common
Mimosaceae		
Acacia senegal	*Phanerophyte*	V. common
A. nilotica	*Phanerophyte*	Common
Rhynchosia minima	*Chaemophyte*	Common
Poaceae		
Aristida adscensionis	*Therophyte*	Common
Cenchrus ciliaris	*Therophyte*	Common
Rhamnaceae		
Ziziphus nummularia	*Phanerophyte*	V. common

Species	Life Form	Abundance
Salvadoraceae		
Salvadora oleoides	*Phanerophyte*	V. common
Lycium edgeworthii	*Chaemophyte*	Common
Tamaricaceae		
Tamarix dioica	*Phanerophyte*	Common
Tiliaceae		
C. tridens L.	*Phanerophyte*	Common
Grewia tenax	*Phanerophyte*	V. common
Typhaceae		
Typha domingensis	*Phanerophyte*	Common
Zygophyllaceae		
Zygophyllum propinquum	*Chaemophyte*	V. common

5.2.3 Faunal Diversity

Project area has variety of ecosystem including Rocky Mountains, Riverine & rocky forests, and plains including scarce agriculture fields. The stony area covered with small stones and scattred bushes. The most species of Indian Gerbil which are living urder stones and it is omnivores, subsisting mainly on vegetable matter, seeds, young shoots, and berries in winter season. It is nocturnal animal. These are very active and run from one shelter to another.

The hilly area is covered with natural vegetation are the bushes, herbs and shrubs. Afghan Hedghog eat food spiders, scorpions, amphibian as well as small lizard, dung beetles and it is nocturnal which dug underground hole and mostly found at hill.

The hilly area contains natural vegetation which include the bushes, herbs and shrubs. Mostly birds are observed, Humid Weather which is the ideal habitats in hilly areas, some tree area are found near the human settlement, where the birds include little brown dove, collard dove and common myna and they feed on seed and nesting on the trees. But the Hilly areas are ideal place for birds of prey. Such as Kestrel which is the resident birds and feeds on Mice, insects, scan the ground and bushes for food.

The Study area is situated near village Haji Shah Bag (Goth Abbas), Tehsil Gadani, District Lasbela, Balochistan.

Mammals

Methodology of Mammals

1) One hour plot searching and making location by GPS.
2) "Spot lighting Method" This method is used for locating small mammals such as, red fox etc. Because all are nocturnal animals move for food. In this way the populations of different species at different locations is estimated.
3) Counting the fresh holes, tracks are also used to determine the population range, shelter and status of mammals is determined. Fresh holes and tracks are counted in the study area of 500 m, with the helps of holes are the estimate of population.

Results of Mammals:

During the survey 05 species of small mammals and 02 large mammals were recorded in our study.

Table 5-11: List of Mammals in Project Adjacent

S. No	Scientific Name	English Name	Status
1	*Mus Musculus*	House Mouse	Less common
2	*Tatera indica*	Indian Gerbil	Common
3	*Vulpes Vulpes*	Red Fox	Less common
4	*Gerbillus nanus*	Balochistan Gerbil	Common
5	*Canis aureus*	Jackal	Less Common
6	*Hemiechinus auritus megalotis*	Afghan Hedgehog	Less common
7	*Hystrix Indca*	Porcupine	common

Reptiles

Methodology of Reptiles

Following methods have been used for reptilian survey.

A) ***Direct Counting***

1) One hour plot searching using GPS.

2) Pit Fall Traps.

3) Spot Lighting.

4) Incidental Sightings.

5) Turning Stones and rotten trees.

6) By basking behavior.

7) By hand picking method.

B) ***Indirect Counting***

1) Information from different sources.

   Presence of signs like faecal pellets, Tracks, den or Tunnels (Egg laying Excavation).

2) One hour plot searching using GPS:

   This method is used for searching habitat with the help of GPS.

3) Spot lighting:

   This method can be used mostly for nocturnal animals.

4) Incidental Sighting:

   This method can be used by suddenly observation.

5) Turning Stones and Rotten Trees:

This method can be used for those species which hide under the stones and bushes.

6) By Basking Behaviour:

This method can be used when the species sun bath during daytime.

C) Indirect Method

1) Information from different resources:

This method can be used when the local people met & give it interviews and got the information

2) Presence of signs like pellets Tracks, Den or Tunnels (Egg Laying Excavation).

This method can be used when some evidence watch like footprints. Dropping and eggs etc.

3) Counting the fresh borrows,

tracks by used this method the population Range, shelter and status of reptiles is determined. Fresh borrows and tracks are counted in the study area of 500m, with the helps of borrows are The estimate of population.

Results of Reptiles:

During the survey 11 species of herpetofauna were recorded 9 species are common, 2 species are less common recorded from the project district area.

Table 5-12: List of Reptiles in Project Adjacent

S.No	Scientific Name	Common Name	Status
1	*Trapelus megalonyx*	Ocellate Ground agama	Common
2	*Echis carinatus*	Saw scaled viper	Common
3	Ophisops jerdonii	Rugose spectled lacerta	Less Common
4	*Laudakia melanura*	Black rock agama	Common
5	*Bufo stomaticus*	Indus valley toad	Common
6	*Calotes versicolor*	Common Tree lizard	Common
7	*Agamura persica*	Persin spider gecko	Common
8	*Phrynocephalus luteoguttatus*	Yellow spectled toad agama	Less common
9	*Hamidactylus flaviviridis*	Yellow belly Common House gecko	Common
10	*Laudakia melanura*	Black rock agama	Common
11	*Platyceps rhodorachis*	Cliff racer	Common

Birds

Birds Methodology

The Birds were surveyed in the month of April 2019 for Summer birds and resident birds. Sandy and Hilly Area was visited during the survey period and counts were made at different selected points. The birds were directly observed, identified and counted with the help of binoculars and photographs were also taken.

Results of Birds:

During the survey 23 species were recorded 11 species are common, 12 species less common in project district area.

Table 5-13: List of Birds in Project Adjacent

S.No.	Scientific Name	Common Name	Status
1	Galerida cristata	Crested Lark	Common
2	*Alauda gulgula*	Sky's lark	Common
3	*Melanocorypha calandra*	Calandra lark	Less Common
4	*Calandrella cinerea*	Short toed lark	Common
5	Ammomanes deserti	Desert lark	Common
6	*Alaemom alaudipes*	Hoopoe lark	Less Common
7	*Ammomanes deserti*	Bar tailed desert lark	Less Common
8	*Delichon urbica*	House Martin	Less Common
9	*Oenanthe alboniger*	Humes wheatear	Common
10	*Oenanthe picata*	Variable wheatear	Less Common
11	*Oenanthe deserti*	Desert wheatear	Less Common
12	Lanius excubitor	Great Grey Shrike	Less Common
13	*Prinia inornata*	Plain Prinia	Less Common
14	Passer domestics	House Sparrow	Less Common
15	Acridotheris tristis	Common Myna	Common
16	*Streptopelia senegalensis*	Little brown dove	Common
17	*Streptopelia decaocto*	Collard dove	Common
18	*Ammopedrix griseogularis*	See-See Partridge	Common
19	*Meropus orientalis*	Little green bee-eater	Common
20	*Upupa epops*	Hoopoe	Less Common
21	*Coracias benghalensis*	Indian roller	Less Common
22	*Camprimulgus asiaticus*	Indian Nightjar	Less common
23	*Pycnonotus leucogenys*	White cheeked bulbul	Common

5.3 Socio-economic and Cultural Environment

5.3.1 Scope and Methodology

A team comprising environmental assessment specialist, sociologist, environmental scientist and gender specialist carried out the study of socio economic and cultural environment of the project area. The approach and methodology during data collection was a combination of qualitative and quantitative data gathering techniques. The data collection addresses the primary requirements of an Environmental Impact Assessment (EIA), incorporating the Pakistan Environmental Assessment Procedures 1997. A participatory rural assessment was combined with the extensive qualitative data collection of socio-economic and cultural data through short structured questionnaires and focus group interviews with communities and key male informants in the project area. The relevant and accurate information was obtained through professionally competent surveyors. The required information collected efficiently in terms of time and area covered by rapid cycles of interaction with team members and communities. The specific tools used for collection of data include i.e. direct observation, short questionnaire, focus groups and semi-structured interviews.

5.3.2 Geography

The proposed project lies in tehsil Gadani & district lasbela of Balochistan Province, Pakistan. District lasbela has area of 15,153 Square Kilo-meters with population of 574,292. Area-wise district Lasbela is the 7th largest district in Balochistan and has an area of 15,153 square kilometers, Lasbela District, lies between 65°12'11"-67°25'39" East longitudes and 24°53'2"-26°39'20" North latitudes and consists of 5 Tehsils and 22 Union Councils. Location of Lasbela is at 1,075km (aerial distance) south-east (218 degrees bearing) of Pakistan's Capital City Islamabad and 116 km north-west (333 degrees bearing) from Karachi, the Pakistan's economic port of financial turnover.

Table 5-14: Sub District & U.C of District Lasbela

Tehsil	Union Council
Bela	Kathore, Welpat Janubi, Welpat Shumali, Bela, Gadore
Dureji	Dureji, Lohi
Gaddani	Gadani, Hub
Hub	Kanraj, Allahabad, Sakran, Sonmiani, Winder, Baroot, Pathra
Uthal	Khenwari, Wayara, Lakhra, Sheh, Uthal, Liari
There are total 5 Tehsils and 22 Union Councils in the district	

5.3.3 Demographics

Population

According to census 2017 total population of District Lasbela is 574292 Total population males are 299299, females are 274985 and Shemale / Transgender are 08. Average annual growth rate is 3.24 from 1998 to 2017. Balochi and Sindhi are the predominant languages being spoken in the district. The project area falls under Sub-urban parts of District lasbela with majority of Balochi and Sindhi speaking inhabitants. During field survey & primary consultation, we observed that most of locals also understand Urdu language.

5.3.4 Livelihood

House Infrastructure

Most families in the project area live in kaccha houses (made of wood and mud bricks).

Energy Source

Power supply line goes all along the Project area, as 40% community got electricity but always problem shooting and no proper availability of electricity. Communities with absence of electricity expressed need for electricity during the field visit. Gas supply has not been provided to any of the community in the project area, so people depend on fuel wood. But some business community in Gaddani, Hub & Uthal avail gas cylinder facility for cooking. Main fuel use of cooking is 82% Wood, 4% Straw/grass, 2% Animal dung (Source: MICS 2010). Gas is provided only to the industrial area of Hub. Work is in progress for the supply of gas for domestic and commercial use for rest of the areas.

Drinking Water

The shortage of drinking water is an emerging development challenge in Pakistan, especially in rural areas. In district lasbela Balochistan people access drinking water in a variety of

ways. It was noted that there was no water supply system available in the project area. Tube wells are major source of ground water for drinking purpose. Most of the population in the project area relies on groundwater for consumption.

Source of Income Generation

The project is in sub-urban area so mainly their source of income is agricultural, and worked on daily wages. Oil refinery is located around 5km from project area so most of peoples are working in this factory as a labour. If we check the source of income of district lasbela Balochistan, about 44 percent of total employed population is skilled agricultural and fishery workers, the next higher occupation group comprising 27.80 percent is of unskilled workers in agriculture, followed by 6.26 percent workers not classified by occupation, 5.53 percent professionals, 5.42 percent services workers, shop, market sales workers the rest 11.16 percent of employed population are engaged in the remaining occupational.

Agriculture

District lasbela Balochistan has low land utilization due to limited resources of irrigation. 52% of the district is not cultivated due to lack of irrigation water. Project area is a rain fed area and their agriculture activities dependent on rain, so some limited number and crops are possible viz mustered, sun flower, tomatoes, chilies, sorghum, cucumber etc. As Lasbela district falls in the tropical agro-ecological zone bearing a total potential agricultural area of 976,546 hectares (Agriculture Statistics, 2008-09), which is approximately 64% of the total geographical area of District Lasbela.

There are two cropping seasons:

Rabi Crops: Rabi crops include Wheat, Barley, Pulse, Vegetable and Fodder. These crops are sown in winter or during early summer and harvested in late summer.

Kharif Crops: Kharif crops include Sorghum (Jowar), Millet (Bajra), Maize, Sesame, Castor seed, Mung bean, fruit, Onion, vegetable, Melon, Chilies, Fodder, Coriander, Guar Seed, Sugarcane and Cotton. All these are considered cash crops and they are sown in the summer and harvested in late summer or early winter

Livestock and Poultry Farming

Livestock farming is a traditional activity in the district and comprises rearing of Goats, Sheep, Cows, Cattle, Camels and Donkeys. Goat constitutes major portion of the livestock population in the district. Livestock Department, headed by the Deputy Director along with

its staff, manages and controls all the activities pertaining to livestock including animal health coverage and husbandry. Vaccination is being carried out free of cost, whereas the treatment is provided at 50% subsidized rates.

The highest reported population among all the ruminants was 794,296 of goats (Livestock Census, 2006). This shows that goats are the preferred farm animals that people like to keep and rear as compared to any other livestock species due to

suitable weather conditions and the ease of keeping them. The business of Livestock is the main source of the income generation of the people of this area.

Female Responsibilities

The main occupation of women in rural areas of District lasbela Balochistan is house-keeping which includes attending to the cattle, milking them, weaving and sewing fishing nets and family clothes. In city women are house-wives.

5.3.5 Health

There is no medical facility found around the proposed project site but dispensary is found in Hub which is located approximately 2km away from project area. However, in case of severe health problems people moves to District Lasbela Government hospital or Karachi hospitals.

5.3.6 Education

Literacy is a major cornerstone of human development and in the fight against poverty. Its influence spans many sectors - health, social and economic. The children of literate parents are much more likely to be educated and prepared for a better life and a literate population has better economic prospects than an illiterate one. Information on literacy was obtained by asking respondents whether they were able to read and write with understanding from a list of languages (Urdu, English, Pushto, Balochi, Brahvi, Sindhi), but excluding Quranic reading, if this was the only response.

Just over one-quarter (28%) of the population 10 years and over is literate, with males 39% and females 16%, (23% higher in males compared with females). There is also similar difference between males and female literacy in rural (33 vs. 10%) and urban areas (65 vs. 40%).

Literacy rates were highest in Quetta Zarghoon (59%) and Quetta Chiltan (49%) Towns and least in Kohlu, JhalMagsi, Musa Khail and Killa Abdullah and DeraBugti districts (under 20%). The 1998 Population Census reported 25% literacy rate for 10 years and over, with 34% males vs. 14% for females – a difference of 20%. The results can be compared as the survey used the same codes as the Census. The findings from MICS suggest that the rates are improving, but only a little. The PIHS 2001 reported a higher result than that of the MICS (36 vs. 28%), but the definitions were not the same.

Table 5-15: Literacy Rate (10 Years and over)

	Balochistan	Urban	Rural
Male	39	65	33
Female	16	40	10
Total	28	54	23

5.3.7 Major Needs of the People

The socio-economic status of the people living in the area is not very good. The wide spread poverty encircled by the selective continuance of so called social & cultural customs, governed by the feudal and gender biased system of decision making at the community level, are still very much there in practice. The drinking water availability, schools, medical treatments and the sanitation conditions are the basic problems of the people living in this area. They lack many of the basic amenities of life. The health and education facilities are not available to all people in this area and the quality of available facilities is very poor. The health care facilities are inadequate, ineffective and neglected in this area. The literacy rate is comparative very low in the area, which could be improved by increasing the facilities of education in terms of quality and quantity both.

5.3.8 Leadership Dynamics

There is a different hierarchy of leadership in the project area i.e. village leaders, community leaders, political leaders and spiritual leaders. The village leader is normally the most influential person of the village in term of land. Minor conflicts are resolved at village level. However, if the conflict is bigger and complex, the community leader resolves the conflict through listening to both sides. The community approaching to the police is a rare case for resolving their problems. Most of the conflicts occur due to tribal disputes, dispute on land, theft of animals, arrangement of marriages etc.

5.3.9 Archeological Sites

There is no archaeological site near the project area although nearest villages do have mosques and graveyards.

5.3.10 Perception about the Proposed Project

Focused group discussions revealed a high satisfaction of locals, based on jobs. Most participants expressed no serious complaints regarding proposed project activities in the area and welcomed the idea of the proposed project.

The community members also hoped that the new project will provide jobs for local and Premier Motors Limited will also provide health and education facilities as welfare work in the area. They also highlighted that unemployment, non-availability of higher education and health facilities are major issues of the area.

5.3.11 Benefits of Proposed Project on Socioeconomic Environment of the Community Area

The present data was collected to assess the socioeconomic and cultural impact of the project. The project will improve the business opportunities and employment in the project area. This will increase the income of households of local population. This extra income may be used to finance education, health, clothing and other basic needs, with positive implications for rural welfare and living standards.

Figure 5-13: Pictorial Presentation of Socioeconomic Settings of the Project Area

Police Chawki near the Project area

School near the project area

Marriage Hall near project area

Drinking Water tanker for the community

Shops near Project area

Livelihood (Domestic Animal) near Project area

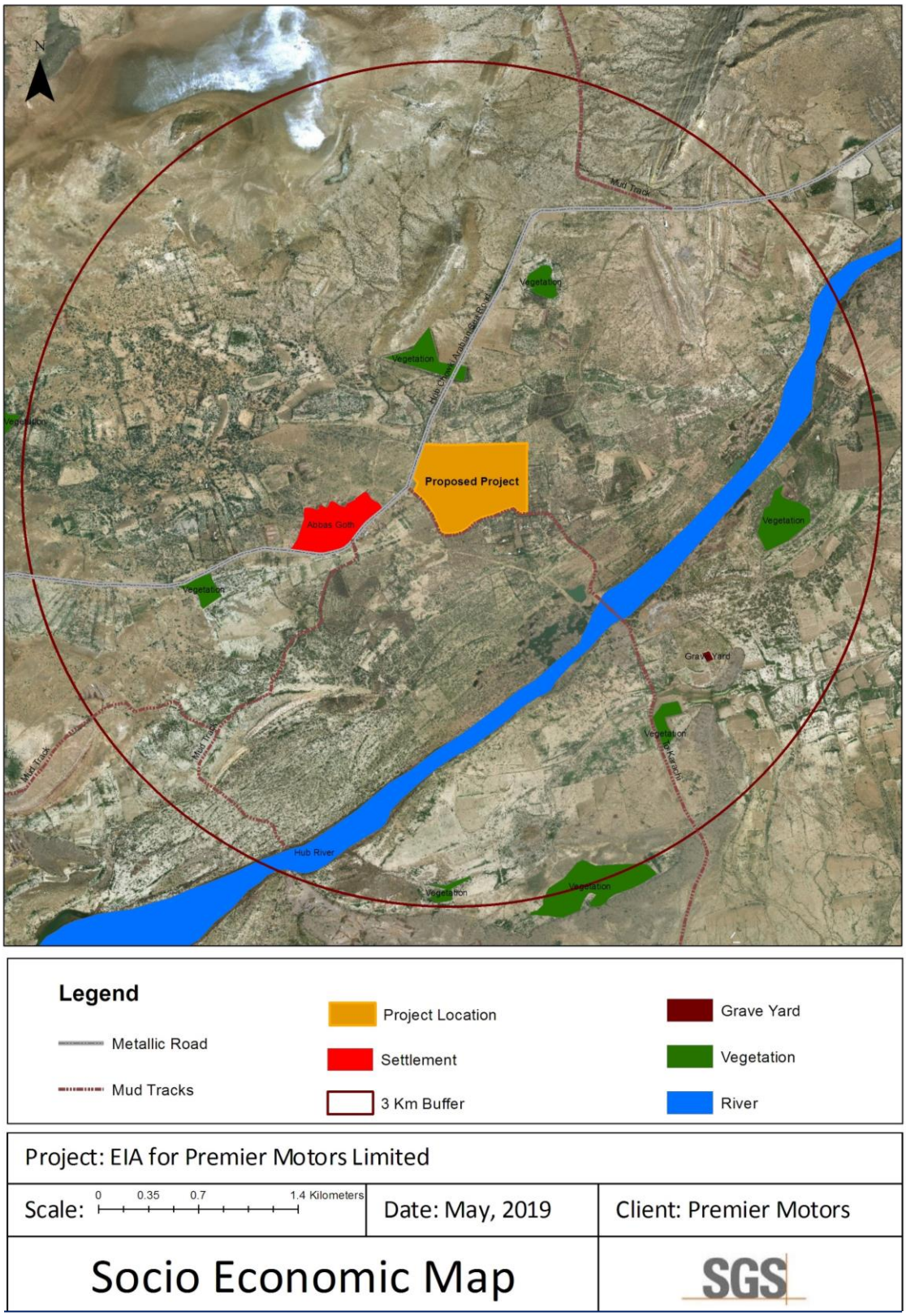
Solar Panel in Abbas Goth near Project area

Minor Agricultural Activities in Abbas Goth

Small Farm near Goth Abbas

Small Shops near Abbas Goth

Figure 5-14: Socioeconomic Map of the Project Area



6. Stakeholders Consultation

Stakeholder consultation is a mean of involving all primary and secondary stakeholders in the project's decision-making process to address their concerns, improve project design, and give the project legitimacy. Stakeholder consultation, if conducted in a participatory and objective manner, is a mean of enhancing project sustainability.

Community input (both of knowledge and values) on socioeconomic and environmental issues can greatly enhance the quality of decision-making. Stakeholder consultation was therefore conducted in the project area not only to satisfy the legal requirements of the EIA process in Pakistan but also to improve and enhance the social and environmental design of the project.

The participation of project stakeholders in project planning, design and implementation is now universally recognized as an integral part of environmental impact assessment. The Balochistan Environmental Protection Act 2012 (Section-15(3)) highlights that "every review of an environmental impact assessment (EIA) shall be carried out with public participation."

This section of the report outlines the stakeholder consultation approach adopted for this EIA study, identifies the concerned groups of stakeholders, and describes the consultation process carried out as part of this study**. Figure 6-1** and **6-2** shows pictorial presentation of stakeholder's meetings.

6.1 Objectives of Stakeholders Consultation

The process of public participation and consultation was endorsed in the United Nations Conference on the Environment and Development (UNCED) in 1992 through one of the key documents of the conference-Agenda 21. Agenda 21 is a comprehensive strategy for global action on sustainable development and deals with issues regarding human interaction with the environment. It emphasizes the role of public participation in environmental decision-making for the achievement of sustainable development.

Through the public consultation process, SGS Pakistan Private Limited Consultants hope to:

- Promote better understanding of the project, its objective, and its likely impact
- Identify and address concerns of all interested and affected parties of project area
- Provide a means to identify and resolve issues before plans are finalized and development commences, thus avoiding public anger and resentment and potentially costly delays
- Encourage transparency and inculcate trust among various stakeholders to promote cooperation and partnership with the communities and local leadership

6.2 Consultation Process

Primary stakeholders were consulted during informal and formal meetings held in the project area. The consultation process was carried out in Urdu language because mostly peoples know about Urdu language. During these meetings a simple, non-technical, description of the project was given, with an overview of the project's likely human and environmental impact. This was followed by an open discussion allowing participants to voice their concerns and opinions. In addition to providing communities with information on the proposed project, their feedback was documented during the primary stakeholder consultation. The issues and suggestions raised were recorded in field notes for analysis, and interpretation, by reaching out to a wider segment of the population and using various communication tools such as participatory needs assessment, community consultation meetings, and focus group discussions.

Secondary stakeholder consultations were more formal as government officials were consulted during face-to-face meetings. They were briefed on the EIA process, the project design, and the potential negative and positive impact of the project on the area's environment and communities. It was important not to raise community expectations unnecessarily or unrealistically during the stakeholder consultation meetings to avoid any conflict with local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the EIA report.

6.3 Stakeholders Consulted

In the consultation process for EIA, following key stakeholders were consulted:

- Forest Department of District Lasbela, Balochistan
- Wildlife Department of District Lasbela, Balochistan
- Environmental Protection Agency, Hub, Balochistan

- Irrigation Department District Lasbela, Balochistan
- Health Department District Lasbela, Balochistan
- Lasbela University Uthal Balochistan.
- Local communities
- Non-Governmental Organization (NGO).

Meetings with stakeholders consisted of community consultation meetings, focus group discussions, and in-depth interviews with government officials. The location of the meetings, the process followed, and the outcomes are discussed in this section.

6.4 Primary Stakeholder

The findings of the Community consultations are given as follow. All these have been addressed in various sections of the EIA, and the mitigation plans have been incorporated into the EMP. The summary of the various primary stakeholder consultations is given below.

6.4.1 Community Concerns

Project Approval

The community consultations demonstrated that goodwill towards the project proponents indeed exists; approval for project activities by the communities was evident. The consultations were considered a good gesture and appreciated, especially by the men and village elders. The poverty level is very low such that communities are looking to any project proponent to improve their financial well-being. Project proponent recognizes that benefits from the project should be distributed judiciously and equitably especially among primary stakeholders in the project area and will continue to ensure that this principle is followed in its projects and community development program.

Resettlement/ Relocation

The proposed project land is owned by some local landlords and they provided their land to proponent on Lease for development. The proponent was assured that land will be acquired as per rules and regulations defined by Government of Pakistan.

Local Employment

Communities near the project area emphasized that local villagers should be given priority when employing people for various project-related works and activities according to their skills.

Interaction with Local Community

Non-Local work force coming in the project area that will not be aware of the local customs and norms may result in conflicts with the local community. Most of the project area people welcomed the project idea and showed their comfort-ability in case of non-local work force.

Figure 6-1: Consultation meeting with Primary Stakeholders, District Lasbela, Balochistan

Primary Consultation meeting with Goth Abbas (Haji Ali Shah Baig) residents – Major Settlement near Project area

Primary Consultation meetings with other local peoples of area

6.5 Secondary Stakeholders Consultation

The secondary stakeholder consultation was conducted to provide details about the proposed project and get suggestions if any about the proposed project and its activities. Some of the main offices are mentioned as follow:

Secondary stakeholder consultations were more formal as government officials, and NGOs were consulted during face-to-face meetings. They were briefed on the EIA process, the project design, and the potential negative and positive impact of the project on the area's environment and communities. It was important not to raise community expectations unnecessarily or unrealistically during the stakeholder consultation meetings to avoid any conflict with local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the EIA report. **Table 6-1** enlists the Government department consulted during stakeholder consultation process.

Table 6-1: List of Government Department Consulted during Stakeholder Consultation

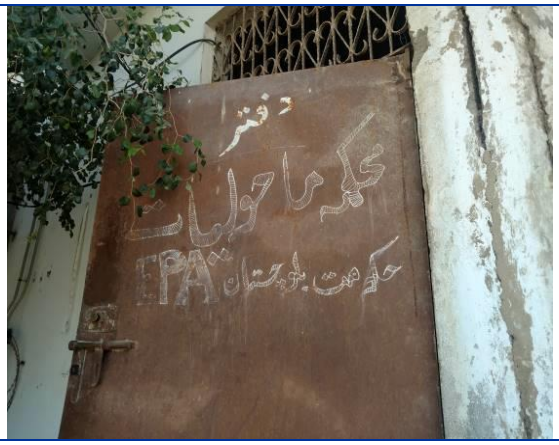
Sr.	*Government and Non-Government Departments*	*Official Name/Designation*
1.	Environmental Protection Agency Balochistan, Hub office	• Mr Muhammad Moosa (Research Asst.) • Mr Abdul Hakeem (Research Asst.)
2.	Irrigation Department Hub, Balochistan.	• Mr. Sikandar (Executive Eng.) • Mr Meer Muhammad (Junior Eng.)
3.	Wildlife Department of Lasbela district, Balochistan	• Mr. Raja Asif latif (Deputy Conservator) • Mr. Abdur Rehman (Sub division officer)
4.	Forest Department of Lasbela district, Balochistan	• Mr Maqbool Hassan Rashdi (Deputy Conservator)
5.	Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS)	• Dr. Muhammad Shafi (Dean of marine-sciences), • Dr. Mureed Hussain Khosa (HOD Geology) • Dr. Abdul Hakeem (HOD Environmental) • Dr. Muhsan Ali (Assistant Prof.)
6.	DHO (District Health Office), Lasbela	• Mr Qader bukhsh (Nutritionist)
7.	NSRP (National Rural Support Programme) Hub, Balochistan.	• Mr Siraj Ahmed (District program officer) • Mr Wajid Ali (field officer)
8.	The Citizens Foundation (**TCF**), Goth Abbas	• Mr. Captain Irfan
9.	Govt Degree College Hub, Balochistan	• Mr. Abdul Rehman

All stakeholders are in favor of proposed project and appreciated and welcomed the idea of car assembling plant in the area. They also added that the proposed project will generate number of direct and indirect employments leading to economic growth of the area

1. Environment Protection Agency, Hub, Balochistan

During the meeting with Mr Muhammad Moosa (Research Asst.), Mr Abdul Hakeem (Research Asst.), they showed positive views about proposed project. They also highlighted that proponent must take all the measures in the protection of environment. Furthermore, they said EPA will respond all their queries after submission of EIA report.



2. Forest Department of District Lasbela, Balochistan

A meeting was held with Mr Maqbool Hassan Rashdi (Deputy Conservator). The concerns and suggestion expressed and response provided is as follows. All these issues (listed below) have been incorporated in Impact mitigation plan and EMP of the EIA report.

- He welcomed the proposed project and showed some positive views for the development of country.
- He also highlighted the importance of tree plantation and that it should be carried out in and around proposed project.
- He confirmed that there is no protected forest area within and around the proposed project.

- Moreover, he asked for some support from the upcoming company for the forest department in terms of plantation.



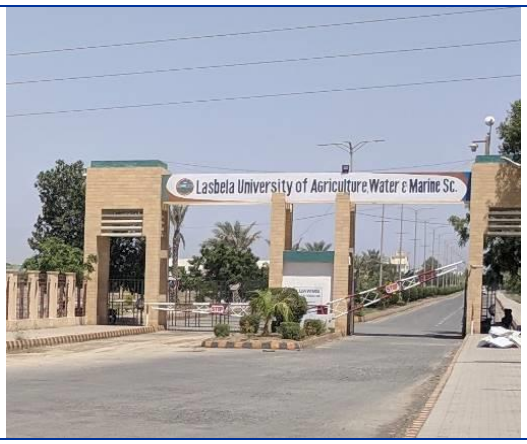

3. Wildlife Department of District Lasbela, Balochistan

A meeting was held with Mr. Raja Asif latif (Deputy Conservator) and Mr. Abdur Rehman (Sub division officer). The concerns and suggestion expressed and response provided is as follows. All these issues (listed below) have been incorporated in Impact mitigation plan and EMP of the EIA report.

- Mr. latif appreciated and welcomed the idea of proposed project in the area. He added that the proposed project will generate employments leading to economic growth.
- He confirmed that there is no protected area within and around the proposed project.
- He suggested that proponent should take part to increase the tourism for the Hingol National Park.
- He advised, during construction hunting and shooting will be strictly prohibited

4. Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS)

During the meeting with Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS) officials highlighted the current condition of the students and poverty level of local communities and showed their concerns that preferences should be given to locals for job during construction and operation phase of project. Moreover, they also highlighted that students must be facilitate by offering them internships, scholarships, apprenticeship and other programs.




5. Irrigation Department Hub, Balochistan

A meeting was held with Mr. Sikandar (Executive Eng.) and Mr. Meer Muhammad (Junior Eng.). The concerns and suggestion expressed and response provided is as follows. All their advises and suggestions (listed below) have been incorporated in impact mitigation plan and EMP of the EIA report.

a. They appreciated and welcomed the idea of proposed project in the area and added that the proposed project will be good for prosperity of local community.

b. In the vicinity of proposed project, there is no major or minor canal in the area.

c. They also pointed that this project should not pollute the environment and take some welfare steps such as construction of hospital and schools, Drinking water filters facilities etc for local communities of the proposed project areas.

d. Proponent must treat the wastewater and meet the NEQS requirement before its final discharge.


6. Government Degree College Hub, Balochistan

A meeting was held with Mr. Abdul Rehman at Govt. Degree College Hub, Balochistan. The concerns and suggestion expressed and response provided is as follows. All advises and suggestions are listed below;

a. He appreciated and welcomed the proposed project in the area and added that the proposed project will bring prosperity for the local region.

b. Proponent must introduce some scholarship and internship program for our college graduate students

c. Preferences should be given to locals for job during construction and operation phase of project

7. The Citizen Foundation School (TCF), Hub

A meeting was held with Mr. Caption Irfan (Focal person of TCF HUB Balochistan). He appreciated the project activities and showed positive concerned regarding upcoming project. He highlighted the status of children education nearby project area and TCF has been working for many years. He advised the proponent to allocate some budget in the Corporate Social Responsibility (CSR) activities for the education of nearby project community.

8. District Health Office (DHO), Lasbela

A meeting was held with Mr. Qader Bukhsh (Head Nutritionist). The concerns and suggestion expressed and response provided is as follows. All these issues (listed below) have been incorporated in Impact mitigation plan and EMP of the EIA report.

- During the meeting with District Health Officer, highlighted the current poverty level of local communities and showed their concerns that proponent should do welfare work for locals of the area.
- He also showed their concern about pollution and wants from proponent to control the pollution and water issues.

Generally, all the primary & secondary stakeholders are in favor of proposed project and admit the proposed project should be executed but ensure the proper implementation of appropriate mitigation measures to reduce the environmental and social impacts.

9. NSRP (National Rural Support Program) Hub, Balochistan.

A meeting was held with Mr. Siraj Ahmed (District program officer) and Mr. Wajid Ali (field officer). The concerns and suggestion expressed and response provided is as follows. All these issues (listed below) have been incorporated in Impact mitigation plan and EMP of the EIA report.

Company should cooperate with the locals by helping them to meet their necessities that include water, electricity, gas, schools and healthcare facilities.

7 Impact Prediction, Evaluation and Mitigation Measures

This chapter discusses the potential environmental and social impacts of the proposed activities, predicts the magnitude of the impact and assesses the significance. The proposed mitigation measures to minimize adverse impacts, resulting residual impacts of the project and environmental management plan (EMP) are discussed in the next chapter.

The discussion of the environmental and socioeconomic impacts is then organized in the following manner:

Impacts Associated with Proposed Project Activities

- Environmental Impact—Construction and Operation Activity
- Socioeconomic Impact— Construction and Operation Activity

7.1 Identification of Potential Impacts

In the first step, potential impacts of the project are identified by desktop screening exercise, using checklist during field visits for collection of baseline data, professional judgment, published literature on environmental impact of similar projects and standard environmental guidelines. A critical step in identifying potential impacts is discussion with project proponent, consultation with stakeholders and community to identify their concern. Public consultation was carried out to identify the concerns of primary and secondary stakeholders.

The main aspect associated with potential impacts are as follow;

- Geomorphology, soil
- Water resources (aquifer and surface water quality)
- Ambient air quality
- Waste (effluent and solid waste) discharges
- Noise pollution
- Protected areas
- Ecology of the area, including flora and fauna

- Vehicle movement
- Socio-economic conditions; and
- Archaeology

7.2 Impact Classification

The potential impacts are classified according to the type of potential receptors. The following receptor categories were used:

- Community (people, their social and cultural values, aspirations and archaeological sensitivity)
- Land and soil (land resources, soil resources)
- Air quality (ambient air quality, GHG emissions, Ozone depletion)
- Water resources (aquifer and surface water resources)
- Ecosystem (vegetation, wildlife, and biodiversity).

7.3 Impact Scoping Criteria

Identified potential impacts are evaluated on the basis of following criteria;

- The present baseline conditions, the change in environmental parameters likely to be affected by proposed project related activities,
- Is there an impact that environmental standards or environmental guidelines applicable to the project will be breached? This includes the national standards such as the National Environmental Quality Standards (NEQS) and guidelines such as the World Bank and WHO environmental guidelines.
- Is there a high risk of a permanent, irreversible, and significant change to environmental conditions due to the particular project activity? Some impacts are transitory; they last until the activity that is the cause of the impact is there. Others may last much longer than the activity. After a long period, the environmental parameter may or may not revert back to its natural state.
- Did the community express any concern about this aspect?

An impact scoping matrix is described in below **Table 7.1.**

Table 7-1: Impact Scoping Matrix

Project Phase	*Environmental Impact*	*Social Impact*
Construction Activities	❑ Water resoures depletion, contamination. ❑ Soil erosion, loss of top soil, contamination spillage. ❑ Drainage and storm water run-off. ❑ Camp effluent. ❑ Waste management, waste generated from construction activity. ❑ Hazardous substances management. ❑ Vehicle and equipment exhaust. ❑ Noise pollution. ❑ Wildlife and habitat loss, relocation. ❑ Clearing of vegetation cover.	❑ Traffic disturbance, conjestion, unrest, road accident. ❑ Employment conflicts. ❑ Archaeological resources damage. ❑ Unskilled labour jobs. ❑ Project and Community Interface.
Operation Activities	❑ Air Pollution ❑ Noise & Vibration Pollution ❑ Wastewater ❑ Green House Gas emissions ❑ Volatile Organic Emission ❑ Water Resources Depletion ❑ Hazardous and non-hazardous substances ❑ Soil Contamination ❑ Waste Management	❑ Traffic disturbance, unrest, road accident during vehcile transportation. ❑ Occupational Health and Safety

7.4 Impact Assessment Methodology

The impacts have been assessed following standard international guidelines and best available practices. The method defines three levels of consequence (or severity) and likelihood (or probability of occurrence) that is High, Medium or Low - of an impact. A standard risk-based approach has been used in which;

- the significance of an impact is determined on the basis of the level of consequence and likelihood of the impact e.g. an impact of medium severity is assigned a low significance if the likelihood of occurrence of the impact is low and high significance if the likelihood of occurrence is high or almost certain. The definition of consequence and likelihood is illustrated in **Table 7.2** and impact significant matrix is provided in **Table 7.3.**

Table 7-2: Definitions for Consequence and Likelihood of Impacts

Level	*Consequence (Severity of Impact)*	*Likelihood*
High	❑ Serious/catastrophic damage to environment. ❑ Direct legislative requirement ❑ Corporate requirement. ❑ Serious threat to corporate reputation/profitability/ability to do business.	❑ High likelihood of occurrence during lifetime of operation. ❑ Regular/continuous part of operations.
Medium	❑ Measurable damage to the environment. ❑ Subject to potential future legislation. ❑ Potential to affect reputation/cost. ❑ Implication/reduced efficiency.	❑ Moderate possibility of occurrence during lifetime of operation. ❑ Periodic/occasional part of operations
Low	❑ Negligible damage to the environment. ❑ No risk to business.	❑ Unlikely to occur during lifetime of operation.

Table 7-3: Impact Significant Matrix

Consequence	**Likelihood**		
	High	**Medium**	**Low**
High	*High*	*High*	*Medium*
Medium	*High*	*Medium*	*Low*
Low	*Medium*	*Low*	*Low*

- The prediction of impacts also includes the duration of impacts (in terms of long-medium and short-term), nature of impact, geographical location of the impact and reversibility of the impact. Impact assessment criteria for the above mention parameters are illustrated in **Table 7.4.**

Table 7-4: Impact Assessment Criteria

Impact Characteristics	*Categories*
Nature of the Impact	**Direct**: The environmental parameter is directly changed by the project. **Indirect:** The environmental parameter changes as a result of change in another parameter.
Duration of the impact	**Short term:** Lasting only till the duration of the project such as noise from the construction activities. **Medium term:** Lasting for a period of few months to a year after the project before naturally reverting to the original condition such as contamination of soil or water by fuels or oil. **Long term:** Lasting for a period much greater than medium term impacts before naturally reverting to the original condition such as loss of soil due to soil erosion.
Geographical Location of the impact	**Local:** Within the area of project i.e. operation site and access road. **Regional:** Within the boundaries of the project area. **National:** Within the boundaries of the country.
Reversibility of the impact	**Reversible:** When a receptor resumes its pre-project condition. **Irreversible:** When a receptor cannot resume its pre-project condition.

- Identification of the mitigation measures: If it is determined that the predicted impact is significant, suitable mitigation measures are identified. There is a range of mitigation measures that can be applied to reduce impacts. This is discussed in following **Sections 7.5, 7.6 and 7.7.**

- Evaluation of the residual impact: Incorporation of the suggested mitigation measures reduces the adverse impact of the project and brings it within the acceptable limit. This step refers to the identification of the anticipated remaining impacts after mitigation measures have been applied—the residual impacts. This is discussed in following **Sections 7.5, 7.6 and 7.7.**

- Identification of the monitoring requirements: The last step in the assessment process is the identification of the monitoring requirements. The scope and frequency of the monitoring depends on the residual impacts. The purpose of monitoring is to confirm that the impact is within the predicted limits and to provide timely information if unacceptable impact is taking place. An environmental management plan (EMP) will be developed with identification of monitoring requirements. This is discussed in next chapter.

7.5 Impacts Assessment for Construction Phase of Project

In this section, environmental issues associated with construction and commissioning phases of proposed activities are identified and their impacts are examined. These impacts are broadly examined under following categories;

- Impacts on physical environment including soil, water, noise, air etc.
- Impacts on biological environment including flora and fauna; and
- Impacts on socioeconomic and cultural environment.

The identified impact's assessment is detailed in the below **Table 7.5**.

Table 7-5: Impact Assessment of Construction & Commissioning Activities

Environmental Aspects	*Potential Impact*	*Project Phase*	*Description*	*Consequence Severity Rating*	*Likelihood /Frequency*	*Nature of Impact*	*Geographical Location of Impact*	*Duration of Impact*	*Reversibility of Impact*	*Significance of Impact*
Protected Areas	Habitat loss, temporary relocation.	C	No protected areas, wetlands or wildlife sanctuary were found inside or in the close proximity of the area.	Low	Low	No impact	Not applicable	Not applicable	Not applicable	Low
Geology and Soils	Soil erosion, soil contamination by the spillage of fuel, oil and chemicals.	C	The construction activity will involve a little bit clearing of land for the purpose of installation of proposed facility. During construction activity, there is the potential for spills of fuel, lubricating oils and chemicals that could lead to soil contamination.	Medium	Low	Direct	Local /Regional	Short Term	Reversible	Low
Water Resources	Depletion of aquifer from overuse, and contamination of water resources by the spillage of fuel, oil and chemicals.	C	There could be potential of local water resources depletion if the project's water needs are fulfilled by extracting water from the ground water of proposed site during Construction Phase. The local water table is available at 80ft to 200ft depth and proposed project activities will utilize local water resources. Surface and aquifer quality may deteriorate if pollutants are mixed with surface runoff during rain and carried to water resources in the vicinity, or if pollutants leach into the ground.	Medium	Medium	Direct	Local /Regional	Short Term	Reversibility depending on the rainfall pattern and aquifer recharge.	Medium
Air Quality	Vehicular emission, Dust emission	C	Construction activities can generate locally exhaust emission and dust	Medium	Medium	Direct	Local/ Regional	Short Term	Irreversible	Medium

Environmental Aspects	*Potential Impact*	*Project Phase*	*Description*	*Consequence Severity Rating*	*Likelihood /Frequency*	*Nature of Impact*	*Geographical Location of Impact*	*Duration of Impact*	*Reversibility of Impact*	*Significance of Impact*
			during activities such as 'earthmoving' operations by using cranes, bulldozers etc and other pollutants emission from diesel generators and vehicles.							
	GHG Emissions	C	The main source for GHG emissions will be generators and vehicles.	Low	Low	Indirect	National	Long term	Irreversible	Low
	Ozone Depletion	C	HCFC and CFC's if any of them used during project activities, can deplete ozone layer.	Low	Low	Indirect	National	Long term	Irreversible	Low
Noise	Impacts at nearest community, Disturbance to the wildlife	C	There is a potential of disturbance to nearby community due to noise. There is also potential of wildlife temporary relocation because of noise.	Medium	Medium	Indirect	Local	Short term	Reversible	Medium
Vibration	Impacts at nearest community, Disturbance to the wildlife	C	There is a potential of disturbance to local community and wildlife relocation because of vibration.	Medium	Low	Indirect	Local	Short term	Reversible	Low
Waste	Liquid Waste: risk of liquid waste contaminating aquifer, contaminating surface water	C	The proposed project activity would generate the liquid waste from campsite. If a soak pit / septic tank is designed, it may cause bad odor	Medium	Low	Direct	local	Short term	Reversible	Low
	Solid Waste (Non-hazardous): Aesthetic issues	C	The proposed project works will result in the generation of a range of non-hazardous solid wastes Food and other biodegradable waste may cause bad odor disturbing the nearby community. Further, food waste may also cause biological hazards e.g. vectors infiltration	Medium	Low	Direct	Regional	Short term	Reversible	Low
	Hazardous waste: soil,	C	Hazardous waste such as waste oil,	Medium	Low	Direct	Local	Short term	Reversible	Low

Environmental Aspects	*Potential Impact*	*Project Phase*	*Description*	*Consequence Severity Rating*	*Likelihood /Frequency*	*Nature of Impact*	*Geographical Location of Impact*	*Duration of Impact*	*Reversibility of Impact*	*Significance of Impact*
	surface and aquifer contamination		batteries, chemicals and clinical waste generated during construction and fabrication activities.						If mitigation measures are adopted	
Traffic	Disturbance to local community	C	During the project activities, the traffic movement on the Hub-Chwaki Arabian Sea road and project site will increase. The project site is located close to Arabian Sea- Hub Chawki Road (~16 km away NE of Hub City) and there is local community close to project site.	Medium	Low	Direct	Local	Short term	Reversible	Low
Wildlife and Habitat	Direct habitat loss and migration of wildlife, Temporary Disturbance to Fauna, Hunting, Accidental killing of wildlife	C	The operation under consideration can result in short term displacement of wildlife species along work areas corridors. There is no potential of habitat loss due to clearing of vegetation as the project site is already barren.	Medium	Low	Direct	Local /Regional	Short to long term	Irreversible	Low
Socio – Economic Environment	Local Procurement of Goods and Service	C	Local procurement of goods and services will be procured from local nearest market in Hub etc. So overall it is benefit for locals.	Positive impact	-	-	-	-	-	Positive impact
	Local Employment	C	Due to proposed project activities, there will be employment opportunities for locals for unskilled work. Almost 1500 - 2000 personnel will be required during construction activities which will generate job opportunities for locals.	Positive impact	-	-	-	-	-	Positive impact

Environmental Aspects	*Potential Impact*	*Project Phase*	*Description*	*Consequence Severity Rating*	*Likelihood /Frequency*	*Nature of Impact*	*Geographical Location of Impact*	*Duration of Impact*	*Reversibility of Impact*	*Significance of Impact*
	Disturbance to community from material and equipment transport	C	Project site is located on Hub Chawki-Arabian Sea Road (Hubco road) with almost smooth flow of traffic movement. There will be no major issue of disturbance for local's due to traffic movement.	Low	Low	No impact	No impact	No impact	No impact	Low
	Employment Conflicts	C	The potential employment related issue includes dissatisfaction among local communities over the number of jobs offered to them, disagreement on definition of 'local' and also on distribution of jobs within the local community.	Low	Low	No impact	No impact	No impact	No impact	Low
	Project and Community Interface	C	Inter-cultural differences between the project staff from other areas/foreigners and the local community can result in frictions.	Low	Low	No impact	No impact	No impact	No impact	Low
	Archaeological Site	C	During site visit, no officially declared archaeological site is found in the proposed area.	Low	Low	No impact	No impact	No impact	No impact	Low

7.6 Discussion on Key Environmental Aspects, Mitigation Measures and Residual Impacts During Construction Phase of Project

The potential impacts of the proposed project have been discussed in the following sections. Where appropriate, mitigation measures have also been included to reduce the unacceptable impacts. This section includes a priority list of the most important measures that the project proponent should adopt to ensure a practical, cost-effective and sufficient approach to impact mitigation. Information is included as to how the recommended mitigation measures should be incorporated into detailed project design and in the contract documents.

Broadly, these measures can be classified into five categories:

- Avoiding the impact altogether by not taking certain proposed activity or parts of an activity, for example, using Halon, HCFC and CFC-free equipment to avoid impact on ozone layer.
- Minimizing impacts by limiting the degree or magnitude of the activity, for example, minimizing dust emission by using water sprinkler.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Compensating for the impact by replacing or providing substitute resources or environments.

The project proponent plays a vital role in developing the mitigation plan by identifying possible mitigation measures and assessing the feasibility of proposed measures.

This section provides a summary of the residual effects that are likely to be present following implementation of the mitigation measures.

7.6.1 Protected Areas

There is no protected area, wetland or wildlife sanctuary inside or in the close proximity of the area.

7.6.2 Geomorphology and Soils

7.6.2.1 *Potential Impacts*

Impacts on geomorphology and soils may arise from the following project activities:

- Clearing and levelling for facility construction site preparation.
- Contamination of soil due to spillage of fuels, oils, or chemicals.
- Physical disturbance as a result of construction;

Likely impacts of these activities can include:

- Physical scarring of the landscape,
- Accelerated soil erosion,
- Alteration of soil quality by loss of topsoil,
- Blockage of natural drainage,
- Soil and water contamination resulting from spillage, leakage or improper solid waste disposal.

7.6.2.2 *Assessment of Potential Impacts*

The site preparation activity for the project would consist primarily of vegetation clearing of the temporary area that would be acquired for the construction of the base camp. Other activities include mobilization of personnel, heavy machinery, equipment and materials to the project area campsite, clearing, to remove vegetation at the site with the use of bulldozers and hydraulic excavator, the latter digs out tree stumps and concrete, vegetation and soil spoils disposal and levelling of cleared area; this requires motor scrappers and grader.

The physical scarring caused by clearing and levelling during proposed site construction activities could lead to alteration of soil quality by removal of topsoil, loses of proposed project site and limited soil erosion induced by disturbance to native soil. The land is almost cleared and levelled and very limited number of trees will be cut. The total area affected would include approximately 120 acres for proposed project, it is expected that

the project crew will use existing roads for transportation of goods. Construction should follow good industry practices to avoid unnecessary clearing outside of the work corridors and likelihood of soil erosion along or across natural drainage paths.

Loss of topsoil may only take place at a few locations during construction/installation activities. However, in view of the limited area covered by proposed project, this impact is expected to be of low significant. The spillage and leakage of fuels, oils, and other chemicals may lead to soil contamination. Possible contaminant sources include fuel, lubricant oil, storage areas and all project vehicles. A spill prevention plan will be developed and implemented.

Considering the limited land area requirement for the development of a proposed project, no significant impacts due to this activity will occur provided the mitigation measures listed in following section of the report are adhered with.

7.6.2.3 *Mitigation Measures*

The proposed mitigation measures to reduce the impacts on geology, topography, and soil during the proposed construction activities are:

- Clearing of vegetation will be kept to minimum;
- Unnecessary clearing of vegetation will be strictly prohibited;
- Vehicle speeds will be regulated and monitored to avoid excessive dust emissions;
- Off-road travel should be avoided and observance of this should be monitored during the operation;
- Use of existing roads for transportation of goods.
- Periodic training will be provided to drivers on mitigation measures related to off-road travel and speeds limits;
- During construction movement of construction equipment will be restricted to work areas only to avoid unnecessary disturbance to soils in the project area;
- The number of routes will be kept to a minimum.

- Open soil should be covered especially during monsoon season
- The construction activities will be planned to keep in view minimum disturbances to soil. Movement of construction equipment will be restricted to avoid unnecessary disturbance to soil.
- Areas along the access track will be visually monitored and any area showing signs of soil erosion will be compacted as necessary;
- Good engineering practices will be adopted during construction activities to ensure that soil erosion is minimized;
- All fuel tanks will be properly marked to highlight their contents;
- Fuel, lubricants, chemicals and oil storage areas will have secondary containment in the form of sand bunds and impervious linings. The volume of the containment area should be equal to 110% of the largest tanks.
- Fuels tanks will be daily checked for leaks and all such leaks will be plugged immediately. Regular inspections would be carried out to detect leakages in construction vehicles and equipment;
- Waste oils should be collected in drums and sold to the recycling contractors.
- Appropriate arrangements, including shovels, plastic bags and absorbent materials, will be available near fuel and oil storage areas.
- A spill prevention and contingency plan will be prepared to deal with spills;
- Photographs will be taken before any activity to record the conditions of campsite and well site at locations that are likely to undergo soil erosion. Similar photographs will be taken after restoration, where applicable.

7.6.2.4 *Residual Impact*

The land use will change as a result of construction and commissioning of the proposed project. The nature of impact is direct. Overall impact on the soil and geomorphology is expected to be medium resulting from medium likelihood. If the mitigation measures are

effectively implemented, the residual impact of the proposed activities on the area's geophysical environment is expected to be low in significance.

7.6.3 Water Resources

The major surface water resource available near the proposed project area is Hub River which is situated at ~02km away in east of project site.

Ground water is the source of water in the project area. Different sources of ground water in the district including tube wells, wells and hand pumps. In the project area, ground water depth varies from 80 to 200 ft.

7.6.3.1 *Environmental Aspects & Impacts*

It is expected that proposed activities could affect the area's water resources in two ways:

- Reduction from overuse, and
- Contamination

7.6.3.2 *Assessment of Potential Impacts*

Water will be required during construction activities. Water will be procured from ground water resources. Water conservation practices will be utilized to reduce the overall water consumption during proposed project activities. Potential sources of pollution in such cases may include:

- Domestic waste (sanitary and kitchen discharge);
- Oil and grease from vehicles and machinery;
- Stored fuel, oil and other chemicals;

7.6.3.3 *Mitigation Measures*

The mitigation measures described below will ensure that the project area's surface and ground water resources are not significantly affected by project activities.

- The water extraction will be kept at minimum;

- Ensure to conduct hydrology study for thorough understanding of aquifer, water table recharge etc before water wells installation to fulfil the need of water during operation phase of project;
- A water management plan will be developed. The plan will also include strategies to minimize water use (and therefore volume of discharge) and maintain reserves;
- Follow good housekeeping practices with all machinery that may potentially discharge into wastewater pit;
- Septic tanks and other wastewater pits will be emptied periodically to ensure that effluent does not overflow into surrounding areas;
- Sumps will remain covered all the time and measures will be taken to prevent rainwater entry;
- Septic tanks and wastewater pits will be designed so that runoff does not flow into them;
- All areas containing potentially hazardous materials will be hydrologically isolated from the remaining site;
- All fuel tanks will be properly marked to highlight their contents;
- Fuels tanks will be daily checked for leaks and all such leaks will be plugged immediately.

7.6.3.4 *Residual Impact*

The nature of impact is direct and its duration is short to long term during construction activities of proposed project and reversible but takes time to rehabilitate the natural environment of the area, so the overall significance of impact is medium resulting from medium likelihood.

If the mitigation measures are effectively implemented, the residual impact of the proposed activities on the area's geophysical environment is expected to be medium to low in significance.

7.6.4 Ambient Air Quality

In the project area, a major ambient air pollution source is the vehicular traffic causes smoke and dust emissions whose effect is localised. The main pollutants are particulate matter, carbon monoxide, sulphur dioxide, and nitrogen oxides (depends on type of fuel used). These emissions generally may affect the air quality in the vicinity of the proposed project area.

Air emissions from proposed project-related activities are likely to include:

- Dust emissions produced during construction activities;
- Combustion products (nitrogen oxides, sulfur dioxide, particulate matter, carbon monoxide, and volatile organic compounds) from diesel generators;
- Combustion products from vehicles used for project-related activities;

Particulate matters in the form of dust, carbon dioxide (CO_2), oxides of nitrogen (NO_X), sulphur dioxide (SO_2), carbon monoxide (CO) and volatile organic compounds (VOCs) are principal atmospheric pollutants from above mentioned sources.CO_2 is the principal greenhouse gas (GHG) among these pollutants. The environmental impacts of stated pollutants are summarized as following.

Type of Emission	*Environmental Impact*
Particulate matters	May cause lungs/respiratory, visibility/haze problem etc.
Carbon dioxide (CO_2)	A GHG that is believed to contribute to climate change.
Carbon monoxide (CO)	Enhances low level ozone production, indirectly contributing to climate change.
Oxides of nitrogen (NO_X)	Contributes to acid deposition (e.g. acid rain). May also enhance ground ozone when mixed with VOCs in sunlight level.
Sulphur dioxide (SO_2)	Contributes to acid deposition (e.g. acid rain). Toxic gas.
Volatile organic compounds (VOCs)	A range of potential impacts, for example hydrocarbons may promote formation of photochemical oxidants. May also be known or suspected carcinogens.

7.6.4.1 *Assessment of Potential Impacts*

The sources of emissions during proposed project construction will not be significantly enough to alter the ambient air quality. The emissions will disperse quickly with the prevalent wind currents. All generators, vehicles, equipment and machinery will be properly maintained during the operation to minimize emissions. Other factors that support the insignificant nature of the impact are:

Dust Emissions: Dust emissions during construction can be an issue. Potential sources of dust emission during construction activities include earthworks (dirt or debris pushing and grading), exposed surfaces, exposed storage piles, truck dumping, hauling, vehicle movement, and concrete mixing and batching.

Dust emitted during construction activities can result in deterioration of ambient air quality in the vicinity of the source, and be a nuisance to the communities and workers. Dust clouds also reduce road visibility, creating a traffic hazard.

Vehicle and Equipment Exhaust Emissions: Combustion processes in generators and other construction equipment result in exhaust gases that can affects the ambient air quality locally. Emissions produced by vehicles and equipment will be in terms of the resulting pollutants (SO_2, NO_X, PM, etc.). However, the environmental issue can be avoided by using properly maintained equipment.

7.6.4.2 *Mitigation Measures*

The mitigation measures given below will further reduce their impact, and ensure that they remain within acceptable limits.

- Water will be sprinkled daily or when there is an obvious dust problem on all exposed surfaces to suppress emission of dust. Frequency of sprinkling will be kept such that the dust remains under control, particularly when wind is blowing towards the receptors.
- All equipment, generators, and vehicles used during the project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions;

- Construction materials that are susceptible to dust formation will be transported only in securely covered trucks to prevent dust emission during transportation.
- All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke;
- Dust emissions during construction activities will be minimised by good management practices such as locating stock piles out of the wind direction, keeping the height of the stock piles to a minimum, keeping earthwork areas damp etc.
- Imposing speed limits and encouraging more efficient journey management will reduce the dust emissions produced by vehicular traffic;

7.6.4.3 *Residual Impact*

Implementation of the proposed mitigation measures is likely to leave no long-term residual impact on the ambient air.

7.6.5 Noise Pollution

7.6.5.1 *Environmental Aspects and Impacts*

Potential sources of noise pollution during project construction process are mainly all kinds of construction machinery, excavators, main power saws, generators, construction equipment, and vehicles during the project activities. Generally different types of vehicles like, 4x4 DD, cranes, lifter, loader, cars, mobile welding plants etc will use during the various project activities.

The potential noise related issues during construction is the disturbance to workers and the surrounding communities of proposed project facility due to construction machinery operation on the proposed site.

Likely impacts of these activities can include:

- Local community disturbance;
- Migration of mammals and birds from the area.

7.6.5.2 *Assessment of Potential Impacts*

The potential sources of significant noise during the construction period include the construction machinery, generators at camps and construction related traffic.

The sound level measured at 1m from construction machinery is listed in below **Table 7.6** while **Table 7.7** shows predicated values of sound level measured at difference distance from construction machinery.

Table 7-6: Construction Machinery Sound Level at 1m Distance

Machine Name	*Sound Level dB(A)*	*Machine Name*	*Sound Level dB(A)*
Concrete mixer	90	**Bulldozer**	90
Saw planer	95	**Excavator**	90
Vibrating rod	95	**Pneumatic tools**	95
Oscillator	95	**Hoist**	80
Drilling pile machine	100	**Crane, elevator**	80

Table 7-7 Construction Machinery in Different Distance of Noise Impact Prediction: dB (A)

Machine Name	*Sound Level dB(A)*							
	1m	*10m*	*20m*	*50m*	*80m*	*100m*	*150m*	*200m*
Concrete mixer	90	70	64	56	51.9	50	46.5	44
Saw planer	95	75	69	61	56.9	55	51.5	49
Vibrating rod	95	75	69	61	56.9	55	51.5	49
Oscillator	95	75	69	61	56.9	55	51.5	49
Drilling pile machine	100	80	74	66	61.9	60	56.5	54
Bulldozer	90	70	64	56	51.9	50	46.5	44
Excavator	90	70	64	56	51.9	50	46.5	44
Pneumatic tools	95	75	69	61	56.9	55	51.5	49
Hoist	80	60	54	46	41.9	40	36.5	34
Crane, elevator	80	60	54	46	41.9	40	36.5	34

There is no continuous major source of noise in the communities. Intermittent sources of noise include road traffic. Increased noise levels during construction activities can be a source of nuisance for locals and a source of disturbance to wildlife.

The predicated sound level at different distance is presented in **Table 7.7** which shows that at 200m distance the construction machinery noise would be in range of 34 to 54dB(A) while the nearest local villages are at distance of 1 to 2 km (1000 to 2000m) so the construction noise will be very minimal at local community.

The main exposure of noise pollution will be on crew members. To minimize exposure to noise personal protective equipment (PPE) will be used by the workers.

There is a potential of temporary wildlife relocation because of noise, so to reduce this impact night work will be minimized thus reducing the disturbance to wildlife. The overall impact level is low in significance as the likelihood of occurrence is low.

7.6.5.3 *Mitigation Measures*

- All on-site personnel will use required personal protective equipment (PPE) in high noise areas that will be clearly marked.
- Proper engineering control will be applied to noise producing sources like generator.
- It will be ensured that generators, vehicles and other potentially noisy equipment used are in good condition. Noise from generators, vehicles and other equipment and machinery will be kept to the minimum through regular maintenance.

The strategy to minimize the noise in the community to within acceptable limits will be based on the following:

- Reduce equipment noise at source;
- Before the start of the operations conduct a noise survey of the equipment and prepare a noise control plan;
- Use noise-abating devices wherever needed and practicable;

- Blowing of horn will be prohibited on the access road to the proposed site and inside the site.

7.6.5.4 *Residual Impact*

By implementing the above mitigation measures the overall impact will be significantly low. Residual noise impact is expected to be low from the construction activities of the proposed facility.

7.6.6 Waste Management

7.6.6.1 *Environmental Aspects and Impacts*

Proposed construction activities will generate different types of waste. This includes domestic garbage, packaging waste, paper waste, glass, metals, concrete waste, oil waste, spilled chemicals and oil, kitchen waste, medical waste effluent i.e. grey water and black water etc.

Improper waste management practices will favor waste accumulation in nearby environment and may deteriorate aesthetical and environmental conditions of the project site and requires serious consideration. The expected waste generated during construction activities and their proposed methods of disposal are discussed below **Table 7.8.**

Likely impacts from hazardous and non- hazardous waste generated by construction activities (if disposed-off improperly) can include:

- Surface and groundwater pollution
- Soil contamination
- Air pollution, odour
- Health hazards
- Aesthetic issues.

Table 7-8: Construction Activities Waste

Category	*Waste Generated and point source*	*How Managed*
Solid Waste		
Hazardous	Batteries, rubber tire, used oil filters, chemical containers, contaminated soil, grease trap sludge	Used oil and ferrous/non-ferrous materials will be provided to approve contractor for recycling. Batteries will be hauled away by contractor for recycling.
Non-hazardous	Packaging waste Paper, textiles cardboard, rubber, wood, glass, tin cans,	Combustible materials such as paper, card board, textiles will be burnt on-site. Non-combustible materials such as glass, plastics, tin and aluminum cans will be hauled away by contractor for recycling.
Non-hazardous	Food waste	Food waste will be burnt in burn pit.
Non-hazardous Recyclable	Cable drums, wood, packaging, scrap metal, recyclable plastic sheeting, debris, plastic, aluminum cans etc.	Will be hauled away by contractor for recycling.
Non-recyclable	Concrete, plaster, plumbing, heating and electrical parts	Plumbing, heating and electrical parts will be hauled away by the contractor for recycling.
Liquid Waste		
Hazardous	Sewerage water	Wastewater from kitchen and washing areas will be collected for reused for plantation. Sewerage will be treated by using septic tank and treated water will be reused for water sprinkling.

7.6.6.2 *Assessment of Potential Impacts*

All the waste generated during construction activities will be disposed of through implementation of an effective waste management plan. By proper implementation of a waste management plan, the overall potential risk/impact will be significantly low.

Domestic Wastes:

Domestic wastes generated during construction activities will include sewage or black water, grey water (from kitchen, laundry, and showers), kitchen wastes, and recyclable wastes. Sewage or black water will be treated and disposed by means of septic tanks and

will be reused for plantation. Grey water will also be collected for reuse in garden or plantation.

Organic waste or compostable material including vegetation waste, food waste and leaves of trees will be utilized for bin composting. Compost would be used as soil conditioner or fertilizer for plants. Recyclable materials such as paper, card board, textiles, plastics, tin and aluminum cans will be hauled away by contractor for recycling.

Oil Stains and Spills:

Fuel or oil stains, leakage or spills during construction operations can result in contamination of soil and water. Consequently, spill containment will be used for all fuel and lubricant storage. All spills to ground will be remediated as soon as reasonably practical.

7.6.6.3 *Mitigation Measures*

- Black water (sewage water) should be disposed through septic system comprising of soak pits and septic tanks.
- Grey water (washing water, kitchen water etc.) should be disposed through soak pits and where required should be sprinkled on access tracks.
- Soak pits and septic tanks should be constructed and designed to accommodate sanitary water i.e. black and grey water.
- At the time of restoration, septic tanks and soak pits should be dismantled and backfilled with at least 1m of topsoil cover above the surrounding surface level
- Solid residue from the septic tanks should be transported to municipal sewage treatment facilities in any nearby city.
- All project related vehicles should be daily checked for fuel or oil leaks. Vehicles with leaks should not be allowed to operate until repaired.
- Chemical and fuel storage areas should be clearly identified by marking.
- Chemical and fuel storage drums/cans should be clearly labelled with safety signs.

- All chemical and fuel storage areas are equipped with secondary containment in the form of concrete or brick masonry dykes/bunds.
- Spill response kit should be available at chemical and fuel storage areas. In addition to this, ensure the availability of shovels, plastic bags, and absorbent material for the spill management.
- Solid waste disposal in the field should not be allowed.
- The recyclable waste should be sent to approved waste contractors/ vender or any other recycling facility for reused.
- Non-recyclable debris and domestic garbage should be stored separately and sent to nearest domestic contractor for final disposal
- Medical waste should be sent to approve incineration facility.

7.6.6.4 *Residual Impact*

Even after implementation of the above measures, it is possible that some littering may take place. Monitoring and inspections will be undertaken to minimize the residual impact.

7.6.7 Vehicular Movement

7.6.7.1 *Environmental Aspects and Impacts*

Proposed project construction activities will involve movement of earth moving and construction equipment, which includes cranes, lifter, loader, cars, double cabin and single cabin pick up. Potential impacts of vehicular movement are;

- Disturbance to local community due to:
- Dust generation
- Elevated noise
- Accidents due to vehicular movement.
- Disturbance to wildlife.

7.6.7.2 *Assessment of Potential Impacts*

Vehicular movement is not a continuous activity which poses continuous impacts on local community and wild life. There are two local villages are located within 1km to 2 km distance from proposed project location. As the project facilities, will maintain appropriate distances from human settlements, disturbance to local community due to dust, noise and accident because of vehicular movement will be less significant. Likewise, impact of noise emission on communities will not be significant when the access tracks are at safe distance. Traffic management plan to avoid/minimize night time movement of vehicles will reduce the disturbance to wildlife. Implementation of following mitigation measures will further reduce any anticipated impact.

7.6.7.3 *Mitigation Measures*

Traffic management plan to avoid/minimize night time movement of vehicles will reduce the disturbance to wildlife. Implementation of following mitigation measures will further reduce any anticipated impact.

- Journey management plan will be developed;
- To the extent possible, peak traffic times will be avoided for project traffic;
- Vehicles will remain confined to defined access;
- Noise from all type of vehicles will be kept to the minimum through regular maintenance.
- The use of horns by project vehicles will be minimised. The use of pressure horns will not be allowed.
- Dust emissions during construction activities will be minimised by good management practices such as locating stock piles out of the wind direction, keeping the height of the stock piles to a minimum, keeping earthwork areas damp etc.
- Where required, water sprinkling will be carried out to minimize dust emissions.
- Imposing speed limits prescribed by Premier Motors Limited, drivers will receive specific direction on this requirement.

- Encourage more efficient journey management will reduce the probability of accidents and dust emissions produced by vehicular traffic.

7.6.7.4 *Residual Impacts*

Some traffic related impacts are likely such as road accident because of project traffic, however, no significant long-term impact is envisaged by proper implementation of journey management plan and trainings of drivers.

7.6.8 Vegetation

7.6.8.1 *Environmental Aspects and Impacts*

The potential impacts on natural vegetation due to proposed project activities are:

- Clearing of or loss to vegetation due to:
- Clearing of land for camp sites, construction/ commissioning of equipment, pipeline laying etc;
- New road construction
- Off road travel.
- Loss of habitat.

7.6.8.2 *Assessment of Potential Impacts*

The vegetation of the project area and in its surroundings, mainly comprise of *Prosopis Juliflora*. During construction and road travel dust will be generated which may accumulate on the road side vegetation and cause possibly hinder the vegetation growth and respiration. The effect of vegetation clearing and loss of habitat is less significant for development activities as the proposed location is already a barren land and mostly comprise of *Prosopis Juliflora*. However, mitigation measures recommended will ensure that the impacts are kept to the minimum possible.

7.6.8.3 *Mitigation Measures*

- Vegetation loss will be kept to an absolute minimum. Cutting of large trees will be avoided;
- Off-road travelling will be minimized;
- Use of local vegetation as fuel by project personnel will be prohibited;
- Engineering practices will be adopted during construction activities to ensure that unnecessary clearing of vegetation outside work areas is avoided;
- Trainings should be provided to drivers on mitigation measures related to off-road travel and speeds limits.

7.6.8.4 *Residual Impact*

Given the current state of the vegetation, and implementation of the proposed mitigation measures, little or no significant residual impact on the natural vegetation of the area is anticipated.

7.6.9 Wildlife and Habitat

7.6.9.1 *Environmental Aspects and Impacts*

Impacts on wildlife may arise from the following project activities:

- Noise generated from project activities;
- Movement of personnel and vehicles;
- Lights used at the project facilities;
- Clearing of vegetation;
- Improper disposal of wastes;

Likely impacts of these activities can include:

- Temporary migration of mammals and bird from the area;
- Accidental killings of wildlife.

7.6.9.2 *Assessment of Potential Impacts*

During the construction/installation activities there will be possible disturbance to wildlife due to disturbance and loss of habitat, clearing and levelling of construction site. Wildlife may also be disturbed due to sensory disturbance from earthwork, construction; movement of vehicles and crew personnel. This can possibly result in changes in distribution and abundance.

To minimize the impact, vegetation loss will be kept to an absolute minimum. Cutting of trees will be avoided. No-hunting and no-trapping policy will be strictly enforced, unless human life is under threat. Most of the animals in the region are common to the area. Birds are least susceptible to the long-term impact of temporary activities, as they are highly mobile and tend to avoid areas of project activity. No endangered or vulnerable species are found in the proposed project area. So, the overall significant of impact is low.

7.6.9.3 *Mitigation Measures*

The following mitigation measures will reduce the adverse impact on the wildlife of the project area:

- Vegetation loss will be kept to an absolute minimum. Cutting of large trees will be avoided;
- Fires in the open will not be allowed;
- A 'no-hunting, no-trapping, no-harassing' policy will be strictly enforced, unless threatening to human life.
- Uncontrolled discharge of waste of any kind will not take place in the area;
- Discharging firearms will be explicitly prohibited;
- General awareness of the crew will be enhanced regarding the wildlife, through environmental training, notice board postings, tool box talks etc;
- The project staff will be educated and instructed to avoid killing. Feeding or harassment of wildlife will not be allowed;

- Physical disturbance to areas outside the work corridors will be avoided;
- The total duration of activities will be minimized by good management;
- All mitigation measures to minimize noise levels, dust emissions, air emissions, and waste management required by the EIA will be adhered to;
- Food wastes will not be disposed-off in the open;
- Movement of all project personnel will be restricted to work areas;
- Night travelling will be kept to a minimum.

7.6.9.4 *Residual Impact*

Once the mitigation measures given above are implemented, it is expected that the project will have lesser significant impacts on the area's wildlife.

7.6.10 Socio-economic Impact

7.6.10.1 *Potential Impacts*

Potential sources of positive and negative impacts on local communities includes:

- Safety and security
- Mobility and transportation
- Project and Community Interface
- Cultural and religious sites
- Archaeological Sites
- Local Economy
- Local Employment

7.6.10.2 *Assessment of Potential Impacts*

Safety and Security:

The operations may affect the safety and security of the inhabitants of the areas in the following ways: conflicts between residents and the construction contractors, carriage of

fire arms on the site will be banned. Community sensitive project planning and implementation as prescribed through the recommended mitigation measures will minimize the occurrence of any such impacts. Further project vehicles will use the existing road and there will be no road safety issues.

Mobility and Transportation:

Project personnel will be given gender sensitization briefings and will be instructed to respect local norms and the local culture of the area.

Project and Community Interface:

During construction phase of the project, inter-cultural differences between the project staff from other areas and the local community could result in frictions.

To mitigate these issues locals will preferred for unskilled jobs. Also with proper management of the workforce, it is possible to avoid any complaints.

Cultural and Religious Opportunities:

Cultural sites in the form of mosques, tombs and graveyards exist in the proximity of project site, but no one is located in close vicinity of project site. So, no negative impact or damage will take place due to construction crew.

Archaeological Sites:

There are no documented sites of archaeological, historical, or cultural significance near project area.

Local Economy:

There will be positive impact on local economy due to project activities:

- Increased turnover of local businesses and shops due to an increased demand from project contractors and their employees. During the proposed project activities such as construction, material such as the gravel, aggregate, steel, cement, sand for well site construction will be procured from local market. General supplies which include camp supplies (food, etc), fuels and oils etc will also be procured from local nearest urban settlements.

- An increase in the income of locals may occur due to employment in the project.

Local Employment:

Distribution of employment opportunities during construction activities. The project will employ local people for unskilled jobs. Local people will be hired for unskilled jobs. When hiring local people, preference will be given to people living within the proximity of project site, as they will be the most directly influenced by the project.

7.6.10.3 *Mitigation Measures*

The following mitigation measures will be implemented:

- Limit the social interaction between the workforce and the local communities;
- All vehicle drivers will be trained in community safety aspects. Drivers will be trained in responsible and safe driving practices; safe speed limits for vehicles will be followed;
- The construction crew's interaction with the local population will be minimized;
- The project proponent and the contractor will maintain liaison with the local community. The communities will be informed of the construction activities well in advance;
- The company will maintain a social complaint register at the site to document all complaints received from local communities. The register will also record the measures taken to mitigate these concerns;
- Awareness and cultural inductions to educate the contractor workforce on the requirement of minimizing social interaction with local communities; Project staff will respect cultural norms;
- The non-local project staff will be sensitized to local culture and norms; Unnecessary interaction of local population with the non-local project staff will be avoided;
- Residents of the area will be informed at least two weeks before project activities commence;

- Maximum number of unskilled and semi-skilled jobs will be reserved for the local communities.

7.6.11 Safety of Workers

Premier Motors Limited management must make sure that workers/contractors should use the Personnel Protective Equipment (PPEs) during construction phase of proposed project specially working on heights, working with machines/equipment, working in dusty and noisy environment etc.

7.6.11.1 *Mitigation Measures*

To ensure worker's safety during construction activities, following measures should be undertaken:

- First Aid box should be placed on site.
- First Aid training should be provided to all supervisory staff.
- Contact addresses and numbers of local hospitals and other emergency organizations should be available on site all the time.

7.6.12 Emergencies and Accidents

Construction activities will increase the possibility of accidental injury or any other emergency situation like fire, oil spill or any natural disaster may be happened which may affect project staff and nearby communities as well. To handle this situation Premier Motors Limited has clearly defined, well-structured and dynamic Emergency Response Plan available to handle level 1 and level 2 emergencies.

7.6.12.1 *Mitigation Measures*

- Ensure emergency response plan should be developed and implemented to cater different emergency situation as mentioned above.
- Ensure project related staffs are well aware and trained on emergency response plan.
- Ensure provision of first aid at site in case of any emergency.

7.7 Impacts Assessment for Operation Activities

The operation activities of automotive industry can be divided into different processes such as Press Shop, Body Shop, Paint Shop, Assembly Shop and Performance Inspection & Test tracks etc. Other activities include wastewater treatment facility, generators, security, solid waste facility; and, office and administrative activities.

In this section, the environmental, occupational health and safety and socioeconomic impacts associated with the proposed project operation activities are discussed. The impacts that are discussed in subsequent sections are as follows:

- Environmental Impacts
  - Air Emissions
  - Water Resources
  - Wastewater/Effluent Management
  - Hazardous Material Management (handling, storage & transportation)
  - Waste Management
  - Noise & vibration
- Occupational Health and Safety
  - Fire and Explosion
  - Burns and Heat Stress
  - Chemical Exposure
  - Confined Spaces
  - Major Accidents
- Socioeconomic Impacts
  - Employment Opportunity
  - Community development

7.8 Discussion on Key Environmental Aspects and Mitigation Measures During Operation Phase of Project

7.8.1 Air Emissions

The air emissions are main environmental concerns pertaining to automotive industry which are emitted from different processes as;

7.8.1.1 *Body Shop with Welding and Joining Operations*

Automotive component and assembly operations rely on welding as the dominant process for joining metal body components. Of the welding processes, resistance spot and seam welding are favored due to the repeatability, simplicity, ease of control, and low cost.

The materials used in body construction are now mostly coated steels and aluminum alloys. The low melting point of the coatings on the steel and welding characteristics of aluminum further increase the amount of material available to be ejected into the tooling and shop environment.

Robotic welding is commonly used after the parts are initially pre-welded. Automated fixtures are often manually loaded and provide only the necessary structural and dimensional control to allow automated welding and assembly operations. Automation and robotic welding is typically used when possible, to perform subsequent welding operations. Manual or stationary spot welding operations are used for small component assembly, low volume operations, and assemblies requiring special accessibility.

Potential Impacts

Production processes in body shop with welding operations result in emission of:

- Fumes and gases from welding and cutting operation;
- Airborne metal particles;
- Abrasive particles from grinding and polishing discs;
- Burned oil fumes;
- Fumes from heated sealant, and;

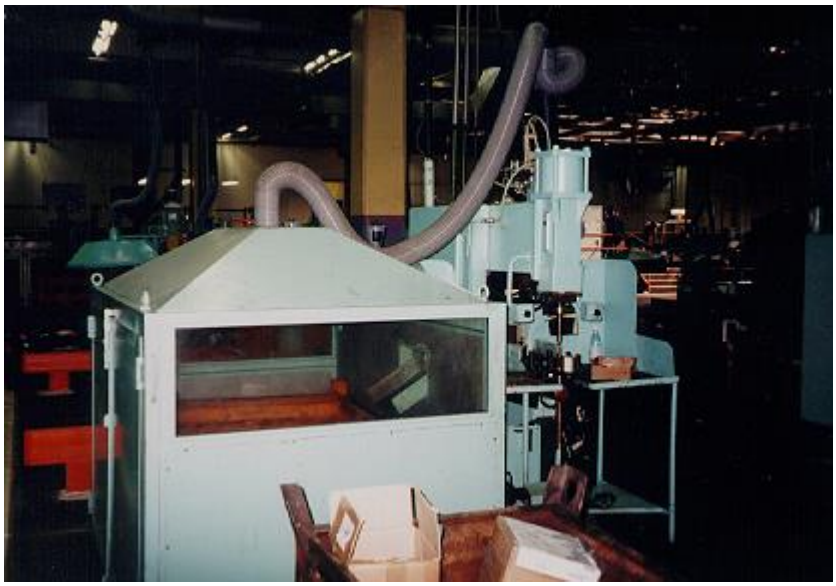
- Heat;

Mitigation Measures;

Process related measures allowing the emission rates reduction;

- Avoid or reduce oil film on the welded surfaces;
- Reduce expulsion with spot welding;
- Avoid short-time conditions with spot welding, changing over to medium-time conditions;
- Place containers with welded small parts in the totally enclosed cabinets connected to exhaust system to avoid residual welding smoke release into the building;
- General ventilation is needed to dilute pollutants not captured by the local and to dilute fumes generated after welding;
- General ventilation systems make-up air to replace air extracted by local and general exhaust systems;
- Buildings should be pressurized to prevent air infiltration creating cold drafts in winter, and hot humid air in summer;
- Air supply and exhaust should be arranged such to create low velocity-low turbulent airflow preventing dust dispersion in the shop;
- Low airflow, high vacuum exhaust systems built-in grinding and polishing machines significantly reduce contaminant load on the building;

Figure 7-1: Exhaust from the enclosure controls residual weld fumes[1]



7.8.1.2 *Paint Shop Areas*

The purpose of paint on an automotive vehicle is to provide;

- Corrosion protection;
- Mechanical protection, like scratch and stone chip;
- Protection against atmospheric and natural influences, like chemical activity and mar;
- Optical appearance, color and general attractiveness;

An automotive paint shop consists of a series of operation steps. Starting from the body shop, the car bodies are transferred to the cleaning and phosphating pre-treatment process, which is performed either in spray or in a combination of spray and immersion process. After pre-treatment phase, the bodies are dip coated by means of the cathaphoretic paint deposition process (also called Electrocoat, E-Coat, or ELPO), the purpose of which is to provide the basic corrosion resistance of the bodies, The E-Coat paint is cured in the dedicated bake oven after which the bodies are transferred to any necessary sanding

[1] Ventilation Guide for Automotive Industry by International Task Force, 1st Edition 2000

operations, underbody protection coating and sealing operations, followed by a sealer oven, in which the sealing materials are cured. The first spray paint process is primer surfacer, which provides a mechanical anti chip protection of the E-coat paint and makes the surface at the body more uniform for subsequent top coat application. The primer surfacer paint is applied an outside and partly on inside surfaces depending of the color system as a single color, 3-4, or more colors. The primer surfacer paint is cured; the bodies are transferred to sanding operations and top coat preparation consisting of body cleaning outside (feather duster machines) and partly inside (mostly manual). The bodies enter the base coat booth, where base coat paint is applied, in most cases in two layers, inside (manual or robotic), outside (mostly automatic), followed by a paint flash off process and a final clear coat application. The topcoat paint application process is finalized by curing, paint quality inspection stations, spat repair stations and transfer to the assembly shop in the plant.

Potential Impacts

Production processes in paint shop results in emission of:

- Volatile Organic Compounds (VOCs) Emissions;
- Fugitive emissions;
- Burned oil fumes;
- Fumes from heated sealant, and;
- Heat;

Mitigation Measures;

- The exhaust air from the spray booth will have to be treated by a venturi wet scrubber or any other paint overspray collector in order to collect paint overspray particles;
- **Temperature**, relative humidity, cleanliness within a paint shop are factors which are important for proper paint application and to create comfortable working condition. Typical design temperatures and humidity for the building side of the paint shops are;

Table 7-9: Temperatures and Humidity for the Typical Design of Paint Shop

Area	*Temperature, °C (°F)*	*Relative Humidity*
	Indoors	
Phosphate pre-coat area	80-90	N.C.
Paint area clean room	80	60%
Oven Strip-out area	80-90	N.C.
Oven area	95- 105	N.C.
Misc. work decks	80	N.C.
Paint Mix/Storage	72	50%
Penthouse Ambient	+10	N.C.

- **Ventilation;** Ventilation systems in paint shops typically consist of general supply and exhaust systems. The major objectives of the paint shop building ventilation system are;
  - Provide required make-up air for process;
  - Maintain proper building pressurization;
  - Maintain comfort for occupants in the building;
  - Provide adequate ventilation air for the occupants

Table 7-10: Typical Ventilation rates for the Paint Shop

Area	*m3/m2 h*	*(cfm/ft^2)*	*ACH*
Phosphate pre-coat area	47	2.5	2.0
Oven Area	47	2.5	4.0
Strip-Out Area	28	1.5	3.0
Paint Shop Area	28	1.5	2.5
Paint Shop Area	28	1.5	2.5

- **Coordination between process and building ventilation;** Make-up air and exhaust air to and from paint booths and oven are provided by process ventilation systems. HVAC systems design of the "clean room" areas and spot cooling of workers on inspection, repair and preparation decks is also responsibility of process engineers;
- **General Supply Systems;** General ventilation supplies 100% outdoor air. The supply air flow rate should exceed the make-up air flow for booths and ovens and be sufficient for building pressure management. General ventilation supply units are located on the building roof or in a penthouse. General exhaust systems typically include roof mounted exhaust fans located in the oven area, laydown area and phosphate area as required to maintain the building air balance;
- **Air distribution;** Air should be supplied into the lower zone (at the floor level where possible) with air diffusers installed evenly along the shop. However, in nearly all paint shops some dumping of air is unavoidable, due to process restrictions;

7.8.1.3 *Assembly Area*

The operation of an automotive assembly line consists of long straight line(s) or line that weave back and forth through the assembly building. Process emissions overview are;

- **Windshield gluing station;** Emissions are generated from the adhesive compounds which are used to seal the windshield to the body frame. In many cases this process is still performed manually, exposing the worker to hazardous solvent vapor compounds which vary depending on manufacturer's blend.
- **Door seals and trim stations;** Emissions are generated from adhesive compounds that are used to attach door seals and interior trim components to the body frame. The affixing of these components subject the worker to solvent vapor compounds which are potentially hazardous but more likely to be annoying or discomforting to the workers or operators in the surrounding areas.
- **Fuel filling station;** Emissions are generated from gasoline and Diesel fuel vapours which are generated during the first fuelling process of the vehcile. These vapors

escape when the air is displaced by the liquid fuel as the fuel tank is filled. Emissions also occur in this area due to spillage which occurs through worker error.

- **Vehicle engine test station;** Emissions are generated when the vehicle is placed on a rolling road (Dyno test) and is accelerated to 50 mph. Since the vehicle's drive train is being engaged and the engine is now required to generate horsepower, the vehicle engine components and exhaust system for the first time are being subjected to elevated exhaust gas temperatures. These elevated temperatures, along with the increased volume and velocity of exhaust gases, bake off and displace contaminants such as engine sealant, lubricants and coolants used to manufacture parts, and fiberglass packing fibers which are manufactured into the exhaust muffler.

Sources of Auto Emissions

Pollutants are emitted from multiple sources from a vehicle manufacturing in the assemble. These emissions are even more concentrated when the vehicle is first started. The following are the thee greatest pollutant sources with the highest level of toxic exposure to plant personnel;

- The by-products of the engine combustion process (gas or diesel) expose workers to NOx, CO, SO2 & CO2, and approximately 100 other VOC, organic, acidic compounds;
- Fuelling losses expose workers to benzene compounds, which have low vapor point and are lighter than air;
- Evaporation of fuels, solvents and oils which react together to develop into complex chemical compounds;

Mitigation Measures;

Process related measures to reduce occupational exposure to vehicle exhausts and fuel vapors

- Separation of areas followed the engine starting from the rest of assembly line by creating a positive pressure buffer zone;

- **Ventilation** systems in the assembly shop typically consist of local exhaust ventilation systems to control vehicle exhaust and contaminant emissions from contaminant producing areas. General ventilation is needed to dilute the contaminants released into the building that are not captured by local ventilation systems. General ventilation systems supply make up air to replace air extracted by local exhaust systems;
- **Windshield Gluing Station Ventilation** The vapors produced by this manual process are captured by back draft or downdraft hood;
- **Door Seals and Trim Stations Ventilation** Local exhaust system use to capture the vapors produced by this manual process is similar to those used at the windshield gluing station: back draft or downdraft hood;
- **Chassis Alignment Inspection Station Ventilation –** The ventilation technique to properly ventilate the exhaust gases and evaporation of fluids off the vehicle is typically handled with a combination system. The pit where plant personnel are located is customarily ventilated through an in-floor method. Vehicle exhaust gases should be removed through the means of a source capture hose extraction system;
- **Paint Rework Station Ventilation –** The ventilation technique to properly ventilate this area is through the use of a combination system consisting of horizontal flow push pull hoods along with a fume extractor arm with built in work lighting;

7.8.2 Noise

The principal sources of noise in automotive facilities include the multiple processes in press shop, body shop, welding area, paint shop and assembly shop.

7.8.2.1 *Mitigation Measures*

The following mitigation measure will be undertaken in order to further reduce the noise levels.

- Noise control devices will be used such as noise barriers and deflectors for high noise impact activities.

- The noise producing equipment will be placed inside the acoustic enclosures to reduce noise at source.
- All equipment with potential of noise generation will be well maintained.
- PPEs will be provided to persons working in close proximity.
- Before the start of the operations conduct a noise survey of the equipment and prepare a noise control plan.

7.8.3 Water Resources

7.8.3.1 *Potential Impacts*

Proposed activities could affect the area's water resources in two ways:

- Reduction from overuse, and
- Contamination

There is no prominent surface water resource is available within the proposed project area except Hub River situated ~02km in east of proposed project.

Ground water is another source of water in the project area. Different sources of ground water in the district including tube wells and dug wells. In the project area, ground water depth varies from 80ft to 200ft.

Due to the particularity of groundwater resources, the project need to be considered sufficient water saving measures in the design, avoid over-exploitation of groundwater resource, environmental impact on the local water resources.

The water feature of this project would be water resource reutilization to minimize the impact on fresh water consumption level.

7.8.3.2 *Assessment of Potential Impacts*

Water consumption during operation phase of the proposed project is anticipated to be 150,000 gallons/day (including production/process water and domestic water). Water will be exploited from ground water aquifer through deep bore wells. The water source wells

would be drilled in order to extract the ground water. In the project area, the depth of water wells varies in range of 80~200ft as per consultation/ feedback from local communities.

Due to the particularity of groundwater resources, the project has considered sufficient water saving measures in the overall design, to avoid over-exploitation of groundwater resource and minimum environmental impact on the local water resources. Further, water conservation practices will be utilized to reduce the water consumption.

Surface water quality may deteriorate if pollutants are mixed with surface runoff during rain and carried to water resources in the vicinity. Potential sources of pollution in such cases may include:

- Domestic waste (sanitary and kitchen discharge);
- Oil and grease from vehicles and machinery;
- Stored fuel, oil and other chemicals;

The project area may expect low average rainfall. All spills will be remediated as soon as reasonably practical. The proposed project's operation phase will develop and implement relevant management system and procedures such as water management plan, spills response plan and good housekeeping practices etc.

7.8.3.3 *Mitigation Measures*

General practices for water management is given in this section while process specific water management/saving measures are given in Wastewater/effluent management section in detail.

General Practices:

- A water management plan will be developed. The plan will also include strategies to minimize water use (and therefore volume of discharge) and maintain reserves; The essential elements of a water monitoring and management program involve:
- Identification, regular measurement, and recording of principal flows within a facility;

- Water measurement (metering) should emphasize areas of greatest water use. Based on review of metering data, 'unaccounted' use–indicating major leaks at industrial facilities– could be identified.
- Follow good housekeeping practices with all machinery that may potentially discharge wastewater;
- No untreated effluents will be released to the environment;

7.8.4 Waste water / Effluent Management

7.8.4.1 *Assessment of Potential Impacts*

The total waste water generation is expected to be 75,000 gallons/day during normal continuous operation and the maximum continuous drainage would be 250,000 gallons/day.

The main process source of waste water generated in automobile industry from paint shop. The automobile industry's wastewater not only contains high levels of suspended and total solids such as oil, grease, dyestuff, chromium, phosphate in washing products, and coloring at various stages of manufacturing but also, a significant amount of dissolved organics, resulting in high BOD & COD loads.

The waste coming out from the paint shop includes different types of wastes. The phosphate unit has phosphate and deionized water rinse, while the Electro-deposition Process (ELPO) unit waste includes the ultra-filtration water, De-ionized water and heavy metals. These wastes are mixed together homogenously in an equalization tank, where they are blended together to get the characteristics of the final waste that will be further treated. From the products of the paint shop is also the paint sludge, which is a by-product of the vehicle surface treatment and painting process. It contains paint sludge, which is paint waste removed from paint both wet eliminators. Phosphate sludge is the metal salts waste from surface chemical treatment of body vehicle.

Sanitary Wastewater: Sanitary wastewaters mainly comes from factory canteen, bathroom, office building and toilet installed in each building unit (toilet wastewater

should be pre-treated in the cesspool). The main pollutants of sanitary wastewater are COD, ammonia, nitrogen, which are sent to effluent treatment plant (ETP) through sanitary wastewater pipeline.

7.8.4.2 *Mitigation Measures*

Effluent Treatment Plant: A modern effluent treatment facility will be provided to treat all these streams. The treatment plant will be based on technology Moving Bed Biofilm Reactor (MBBR) which is a highly effective treatment process consist of combination of conventional activated sludge process and biofilm media. The design scale of effluent treatment facilities is 250,000 gallons/day, and it uses "oil separation, flotation, A/O biochemical reaction, high density coagulation sedimentation and multimedia-filtration" process. The treated water is used as the makeup water, and reuse into the circulating water plant.

- Ensure no wastewater run out from the paint booth while washing and other activities takes place, waste stream should be connected to wastewater treatment plant.
- Sludge should be separated from the wastewater and consider hazardous waste and disposed of environmental friendly with the third-party certification.
- In the basic design and detailed design stage, the selection of measurement, regulation and control instrumentation valves will give full consideration to the use of water-saving instruments and related valves;

Wastewater Recycling:

- According to the principle of clean & waste water diversion and wastewater recycling, the wastewater of the automotive industrial wastewater will be able to be recycled in the process. After stripping, the most water is used into the process facilities, and the rest flows into the effluent treatment plant.
- The wastewater in the whole automotive industry is treated in the effluent treatment plant to achieve the standard for reuse in gardening and other purposes. The treated water is as a part of makeup water, and reuse into the circulating water plant.

7.8.5 Soil Contamination

During the Handling of chemicals there are chances of leaks, spills and accidental mixing of incompatible chemicals. The potential for accidental spills and leaks is highest at the point of transfer of thinners from bulk drum storage to process equipment.

7.8.5.1 *Mitigation Measures*

The recommended mitigation measures are given below:

- Material should never be poured directly from drums to small containers;
- Secondary containment should be provided in order to prevent the soil contamination;
- Spigots or pumps should always be used to transfer waste materials to storage containers;
- Do not handle chemicals with bare hands, no matter how harmless you may think they are;
- After handling chemicals, hands should be washed prior to eating or drinking;
- Chemicals that can produce fumes, dusts should always be handled in a well-ventilated area. Use of containment devices such as fume hoods, and gas cabinets is particularly advisable. A fume hood, glove box or other appropriate exhaust ventilation is necessary when handling particularly hazardous substances;
- Do not eat and drink while working with chemicals;
- Do not light a match or smoke tobacco close to inflammable chemicals;
- Use appropriate devises like funnels or spatulas when transferring chemicals from one container to another or when mixing chemicals;
- Keep work surfaces and containers clean;
- Use corrosion-resistant tools and equipment;

7.8.6 Solid Waste Management

Solid Waste may arise from several sources during assembly and the majority of wastes by volume result from packaging-reusable or disposal. Reusable packaging covers metal racks, bins and containers and disposable packaging covers wood pallets, cardboard, plastic, polystyrene and polythene film.

Other solid wastes include;

- Scrap metal from the press shop, which is normally recycled off-site;
- Metal-rich dust generated by the abrasive disc smoothing of welds and soldered joints;
- Sludge generated by wastewater treatment facilities of equipped vehicle manufacturing plants;
- Additional wastes arise from general operations, cleaning and maintenance and the disposal of faulty equipment and parts;
- Improperly disposed of waste can lead to pollution and ground contamination;

7.8.6.1 *Mitigation Measures*

The recommended mitigation measures are given below:

- Return packaging of hazardous and non-hazardous materials (wherever possible), such as empty drums, to supplier for reuse;
- Recycle packaging wherever possible;
- Develop and implement a waste management plan covering all aspects of waste treatment on site. Wherever possible, priority should be given to reduction of waste generated, and recovery and re-use of raw materials;
- Separate bins will be placed for different types of wastes-plastic, paper, metal, glass, wood and cotton;
- Recyclable material will be separated at source. The recyclable waste will be sold to waste contractors for recycling;
- No waste will be dumped at any location outside the project boundary;

- All hazardous waste will be separated from other wastes. Hazardous wastes will be stored in designated areas with restricted access and proper marking. Hazardous wastes will be disposed-off through approved waste contractors;
- Surplus materials including partially filled chemical and paint containers will be returned to suppliers. Inert wastes will be disposed-off onsite as filled material;
- Records of all waste generated will be maintained. Quantities of wastes disposed, recycled, or reused will be logged on a waste tracking register;
- Training will be provided to personal for identification, segregation and management of waste;

7.8.7 Transportation and Traffic

The proposed project would be expected to result in an increase of several dispatch trucks per week in and out of the property after the new plant is fully operation. This additional truck traffic would constitute the percentage of the current truck traffic on the existing Hub Chaki–Arabian sea road. The additional trucks trips to the site would be easily accommodated within the existing roadway and intersection network.

The proposed project would generate a minor long-term increase in privately-owned vehicle traffic. The proposed plant would operate 24 hours a day, 7 days a week. The new workers would be split among operation shifts, thus reducing the impact on traffic. The additional vehicle traffic would be less than 05 percent of the current annual daily traffic count on the road, and therefore would generate a negligible impact. Proposed project is situated in open barren area, this small increase in vehicle traffic would have only a minor impact to the surrounding community.

7.8.7.1 *Mitigation Measures*

The recommended mitigation measures are given below:

- Vehicle road worthiness certification and vehicle fitness certificate will be ensured;
- Traffic management plan will be developed;

- Transportation safety plan will be established for operations

7.9 Occupational Health and Safety

7.9.1 Burns and Heat Stress

Working at high temperatures can increase the temperature of the working environment which can lead to heat stress for those working in the vicinity. Contact burns can result from contact with hot equipment especially during maintenance activities.

7.9.1.1 *Mitigation Measures*

The recommended mitigation measures are given below:

- Heat stress injuries can be prevented through the implementation of an effective heat stress program

7.9.2 Chemical Exposure

Workers may be subject to potential inhalation hazards (e.g. hydrogen sulphide, carbon monoxide, VOCs, polycyclic aromatic hydrocarbons) during routine plant operations. The use of certain chemical substances in the refining process may lead to chemical burns.

Hazardous chemicals and process gases may be used in the assembly process of motor vehicles. Hazardous properties relating to these substances are many and varied and include flammability, combustion potential, toxicity, corrosive potential and oxidizing potential. Chemicals with such properties should be labelled with the appropriate internationally recognized hazard symbol. Some chemicals may only possess a hazard potential if they have the opportunity to react with other compounds.

7.9.2.1 *Mitigation Measures*

The recommended mitigation measures are given below:

- An Occupational Health and Safety Plan that should include specific job-related risk (maintenance of air quality levels of contaminant, dust vapors and gases for workers in close proximity to storage tanks and recommend limits). In addition, the Management

Plan should provide a means of training workers in the use of the available information on substances from Materials Safety Data Sheet.

- Protection measures should include worker training, work permit systems, use of PPE, and fire alarms.
- Protective and preventative measures should be introduced to eliminate or disrupt source-pathway-receptor relationships. This can be achieved by eliminating the hazard, controlling the hazard, minimizing the hazard and providing appropriate personal equipment (PPE).

7.9.3 Noise & Vibration

Vehicle assembly plants can be noisy work places due to the high level of use of machinery. Transport of products by road may also generate noise. Those at risk include machine operators and those working nearby, e.g. maintenance staff, cleaners, forklift truck drivers and shop floor supervisors.

Noise may reach levels that are hazardous to health, leading to symptoms associated with permanent deafness. Noise, particularly during unsocial hours, may cause annoyance or disruption to local communities.

Hand-arm vibration syndrome from the prolonged use of vibrating tools and machinery causes effects on the body blood circulation known as 'vibration white finger' (VWF). Other damage may be caused to the nerves and muscles of the fingers and hands causing numbness and tingling, reduced grip strength and sensitivity. Pain and stiffness in the hands, and joints of the wrists, elbows and shoulders are other possible symptoms.

7.9.3.1 *Mitigation Measures*

The recommended mitigation measures are given below:

- An integrated approach to HSE and Asset Management should be used to improve safety.

A detailed risk based noise safety management program should be implemented with the following recommendations:

- Maintain on site abatement equipment.
- Provision of personal protective equipment (PPE) that is fit for the task to prevent injury and maintain hygiene standards. Staff should be trained in the correct selection, use and maintenance of PPE.
- Train workers in correct use of machinery and safety devices.
- Ear plugs and Ear muff will be used in high noise areas.

7.10 Environmental and Social Benefits – Operation Phase

7.10.1 Employment

The project operational phase will also generate new jobs. Most of these vacancies will be filled by locals.

Similarly, the construction and operation of the project will create far greater number of indirect income resources for example income resource for transporters for the transportation of the materials, procurement of goods from local market etc.

Overall the proposed project will have a very positive impact on the employment opportunities in the project area.

7.10.2 Community development

Premier Group as a responsible corporate citizen has number of ongoing community development programs. The community developments schemes will remain continue in this new proposed project.

8 Environmental Management Plan

The potential environmental impacts are identified from the planning stage of proposed project through the Environment Impact Assessment (EIA) process. The EIA has identified potential impacts that are likely to arise during the project activities. The EIA has examined in detail both negative and positive impacts at each stage of the project covering both construction and operational phases. To minimize the effects of adverse impacts the EIA has recommended mitigation measures. These mitigation measures include the use of alternative technologies, management and physical controls. The proposed mitigation measures have been based on the understanding of the sensitivity and behavior of environmental receptors in the project area, the legislative controls that apply to the project and a review of good industrial practices while operating in similar environments.

For effective implementation and management of the mitigation measures an Environmental Management Plan (EMP) has been prepared. The EMP satisfies the requirement of the Pakistan Initial Environmental Examination and Environmental Impact Assessment Review Procedures. The EMP is a tool that serves as to manage environmental impacts and specifically focuses on implementation of mitigation measures in its true sense against likely environmental impacts. Both negative and positive impacts at each stage of the project activity have been examined in detail, in this EIA study.

Premier Motors Limited is committed to implement an environmental and social management and monitoring plan which will ensure that the construction and the operation of the proposed project involves full implementation of all proposed mitigation measures and complies with high environmental standards, the requirements of the environmental legislation, and the procedures and guidelines of the World Bank.

Previous sections of this report have outlined the baseline environmental and socio-economic conditions in the area of the proposed development, they have identified the potential impacts on these baseline conditions which could result from construction and operational activities and proposed mitigation measures to minimize or mitigate identified negative impact. To complete the environmental evaluation, this section presents the Environmental Management Plan (EMP) which summarizes the mitigation measures suggested and discusses initial and ongoing monitoring and management of significant impacts of the proposed project.

The EMP is a tool that serves as to manage environmental impacts and specifically focuses on implementation of mitigation measures in its true sense against likely environmental impacts.

The EMP includes the definition of the following measures to minimize environmental effects:

- Construction Management, including control of construction traffic, site drainage, construction waste and spills etc.
- Engineering Design Measures, directly incorporated into the proposed project as good design practice, through the selection of appropriate plant and equipment and choice of construction materials.
- Operational control systems, such as the use of water treatment chemicals.
- Operational Management, which includes staffing levels and staff training.

The effectiveness of these environmental management and mitigation measures will be monitored throughout the construction and operation of the proposed project.

8.1 Purpose and Objectives of the EMP

The primary objectives of the EMP are to:

- Achieve Premier Motors Limited health, safety, environment and quality (HSEQ) goals.
- Facilitate the implementation of the mitigation measures identified in the EIA.
- Define legislative requirements, guidelines and best industry practices that apply to the project.
- Define the responsibilities of the project proponent.
- Define a monitoring mechanism and identify monitoring parameters in order to:
  - Ensure the complete implementation of all mitigation measures.
  - Ensure the effectiveness of the mitigation measures.
- Define requirements for environmental monitoring and auditing.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

8.2 Components of the EMP

The EMP consists of the following:

- Legislation and guidelines
- Organizational structure; roles and responsibilities
- Monitoring / Management plan
- Environmental monitoring
- Communication and documentation
- Change management
- Training programme
- Waste disposal plan
- Restoration and rehabilitation

8.3 Legislation and Guidelines

The EIA has discussed national and international legislation and guidelines that are relevant to the project. Premier Motors Limited will ensure that the project is conducted in conformance to its environmental policy, national legislation and relevant international conventions and that guidance is sought from national and international guidelines. Premier Motors Limited will also ensure that its key project management staff and all its assigned contractors are aware of these legislation and guidelines prior to the start of project activities. The details on national and international legislation and guidelines are given in **Chapter 2** of the report.

8.4 Organizational Structure and Responsibilities

This section provides an organizational structure for environmental management during the proposed project activities and defines the roles and responsibilities of the various players for the duration of the project. The proposed project includes the following organizations:

- Premier Motors Limited as the project proponent and owner of the EMP; and
- The construction, commissioning, operation & maintenance (O&M) contractors as the executors of the EMP;

- Independent Monitoring Consultants (IMC) as the monitors of the execution of the EMP and effects monitoring; and
- Balohistan Environmental Protection Agency and its Hub site office as the regulators.

These organizations will have the following roles and responsibilities during the project activities.

8.4.1 Management Approach

The overall responsibility for compliance with the environmental management plan rests with the project proponent (Premier Motors Limited).

A certain degree of redundancy is inevitable across all management levels, but this is in order to ensure that compliance with the environmental management plan is crosschecked. Other essential features of the EMP are:

- Premier Motors Limited will appoint a Field HSE Representative to accompany the field team throughout the duration of the proposed project.
- Premier Motors Limited will ensure that all contracts it executes with contractors and sub-contractors comply with positive environmental sensibilities and Premier Motors Limited HSEQ Policy and guidelines.
- All HSE personnel will be authorized to implement the policies and requirements of the environmental management plan.
- Premier Motors Limited will cooperate with regulatory agencies and other stakeholders who may intend to send their own teams in, to monitor the activities of construction and operation.

8.4.2 Roles and Responsibilities

Roles and Responsibilities of Project Proponent

Being a project proponent and owner, Premier Motors Limited will be responsible for ensuring the overall implementation of the EMP. Senior Manager Designing and Construction/commissioning, Manager Operation/Plant Manager will be responsible for overall environmental performance of the project, and implementation and compliance of the EMP. The QHSE Manager, will be responsible for providing technical support in environment related issues, Contactor site HSE personal will be responsible for ensuring

implementation of the EMP and will ensure that the project is carried out in accordance with governing legislation, Premier Motors Limited HSEQ Policy and the recommendations laid down in this EIA.

In addition to that Premier Motors Limited will also ensure:

- Deploy a contractor Site HSE Coordinator to accompany field team throughout the duration of the proposed project. HSE field monitor will also deploy by Premier Motors Limited on call out basis to monitor contractors site activities;
- All contracts of Premier Motors Limited which will execute through contractors and sub-contractors comply with environmental sensibilities and Premier Motors Limited HSEQ Policy and guidelines;

Roles and Responsibilities of Project Contractors

Project proponent will appoint construction contractor for the construction, testing and commissioning of the proposed project including the auxiliary facilities. Similarly, Operations and Maintenance (O&M) team will be appointed for operations of the project. O&M contractor will manage all day to day operations of project and will also have the custody of the project. These contractors will be responsible for implementation of, or adherence to, all provisions of the EMP and with any environmental and other codes of conduct required by project proponent. Overall responsibility for environmental performance of the operation will rest with the senior management of the contractors in Pakistan. Site managers of the contractors will be responsible for the effective implementation of the EMP.

Regulators

Balochistan Environmental Protection Agency (BEPA) will monitor compliance with the requirements of EMP of the project and any additional mitigation measures provided in the NOC for the project.

Independent Monitoring Consultant (IMC)

Premier Motors Limited will be responsible for ensuring the overall implementation of the EMP. For this purpose, it is suggested that Premier Motors Limited acquire services of Independent Monitoring Consultant (IMC) for compliance and implementation of EMP. The responsibilities of IMC will include:

- Ensure that all environmental and social parameters/ provisions comply with the applicable standards;
- Ensure that development and operational activities are carried out in an environmentally sound and sustainable manner;
- Organize periodic environmental training programmes and workshops for the Contactor's staff and Site staff in consultation with Premier Motors Limited.

8.4.3 Planning and Design of the Operation

Design of the Operation

Design of the operation includes the activities described in **Chapter 3** of the EIA report. Following approval of the EIA, if any aspect of the operation or requirements of the EIA need to be changed, Premier Motors Limited will categories that change in accordance with the Change Management Plan provided in this EMP and take appropriate measures thereon.

Approvals

Obtaining a No Objection Certificate (NOC) from the Balochistan Environmental Protection Agency (BEPA) will not relieve the proponent of other legal obligations and hence Premier Motors Limited and the project contractors will obtain all other relevant clearances and necessary approvals required by the Government of Pakistan prior to commencing the respective operations.

Contractual Provisions

Adherence to the requirements of the EIA and EMP in terms of environmental mitigation will be required from all project contractors and thus the EMP will form part of their contracts with Project Proponent.

8.4.4 Implementation of the Operation

Co-ordination with Stakeholders

Project Proponent will ensure that co-ordination with project stakeholders on environmental and social matters as required by the EMP and BEPA is maintained throughout the operation.

Environmental Management Systems

Project Proponent and the contractors will ensure that the mitigation measures mentioned in the Environmental Management Plan (**Table 8.1, 8.2**), Site Specific Biodiversity Action plan and Social Impact Management Plan (**Table 8.3**) are adhered to and organisational HSEQ Management Systems are implemented during the proposed project. The contractors will abide by the relevant contractual provisions relating to the environment.

Monitoring

Project proponent and its contractors will ensure that monitoring of the project activities is carried out according to the monitoring programme given in the EMP.

Change management

The EIA for the proposed operation recognises that changes in the operation or the EMP may be required during the operation and therefore provides a Change Management Plan to manage such changes. Overall responsibility for the preparation of change management statements will lie with Project Proponent.

Emergency Procedures

Project Proponent and its contractor will prepare and maintain contingency plans to deal with any emergency situation that may arise during the operation e.g. fire, major chemical spills, medical evacuation and communicate these to the regulatory agencies (if required by these agencies). Emergency plans will be in accordance to Premier Motors Limited internal procedures.

Training

Project proponent and its contractors and suppliers will be responsible for the selection and training of their staff which are capable of completing the project activities in an environmentally safe manner. Project proponent and its contractors and suppliers will be responsible for providing induction to their staff members on the EIA, the EMP and their implementation provided in the EMP. The contractors will be responsible for providing awareness training on potential environmental issues of the project to all personnel at site. In addition, trainings on medical evaluation, emergency preparedness and implementation of EMP will also be covered during the training.

Communication and Documentation

For effective monitoring, management and documentation of the environmental performance during the operation, environmental matters will be discussed during daily meetings held on-site. Environmental concerns raised during the meetings will be mitigated after discussions between project proponent and the contractors. Any issues that require attention of project proponent higher management will be communicated to them for action. Project proponent and its contractors will ensure that the communication and documentation requirements specified in the EMP are fulfilled during the project.

Operations Monitoring

Project proponent and its contractors will be responsible for effective monitoring for efficient operations of the proposed project. Proposed project and its auxiliary systems will be monitored for their performance within the acceptable limits.

Restoration

Project proponent will ensure that the restoration of the site after the end of construction and commissioning activities and after the useful life of proposed project is carried out according to the requirements of the EIA and EMP.

Audits

Project proponent and its contractor and sub-contractors will carry out periodic audits/inspections of all project activities regarding their effects on the surrounding environment. The contractors will take account of any recommendations relating to the operation arising during the monitoring, with the prior consent of the proponent.

8.5 Environmental Monitoring / Management Plan

The Environmental Management and Monitoring Plan (EMMP) will be used as a management and monitoring tool for implementation of the mitigation measures identified by the EIA.

The purpose of monitoring is to ensure that the impact is within the predicted limits and to provide timely information if unacceptable impact is taking place. The scope and frequency of the monitoring depends on the residual impacts identified in **Chapter 7** of the report. To address the mitigation measure and monitoring requirement identified in EIA, a management

plan is developed. It ensures that the project is designed, constructed, maintained and implemented in the manner described in the EIA.

The Environmental Management and Monitoring Plan (EMMP) will be used as a management and monitoring tool for implementation of the mitigation measures identified by the EIA.

A detailed monitoring plan for Construction/Commissioning and Operational Activities is discussed in **Table 8-1, Table 8-2** respectively and Site-Specific Biodiversity Action Plan is discussed in **Table 8-3.** This table lists all the project component's impacts and their associated mitigation measures identified in the EIA. For each component, the following information is presented in the plan:

- The required mitigation measures recommended in EIA.
- The person/organization directly responsible for adhereing to or excuting the required mitigation measures.
- The person/organization responsible for ensuring and monitoring adherence to mitigation measures.
- The parameters which will be monitored to ensure complaince with the mitigation measures.
- A timescale for the implementation of the action to ensure that the objectives of mitigation are fully achieved.

Table 8-1: Environmental Management Plan for Construction/Commissioning Activities

No	*Impact*		*Mitigation Measures*	*Responsibility*		*Action/Monitoring Parameter/Monitoring Method*	*Timing*
				Execution	*Monitoring*		
1.	Soil Erosion & Contamination	1.1	Unnecessary clearing outside work areas will be avoided.	CC	PP	Monitor land clearing activities.	During construction phase
		1.2	Unnecessary clearing of vegetation will be strictly prohibited.	CC	PP	Check the sites and routes selected for camp site and monitor land clearing activities.	Before land clearing
		1.3	Vehicle speeds will be regulated and monitored to avoid excessive dust emissions.	CC	PP	Set speed limits, train drivers and check Compliance.	During construction phase
		1.4	Periodic trainings will be provided to drivers on mitigation measures related to off-road travel and speeds limits.	CC	PP	Check training records.	During construction phase
		1.5	Off-road travel should be avoided and observance of this should be monitored during the activities.	CC	PP	Approve access track and monitor off road travel.	During construction phase
		1.6	Incident record of all moderate and major spills will be maintained. The record will include the location of spill; estimated quantity; spill material; restoration measures; photographs; description of any damage to vegetation, water resource, and corrective measures taken.	CC	PP	Check compliance	During construction phase.
		1.7	Fuel tanks will be daily checked for leaks and all such leaked will be plugged immediately.	CC	PP	Daily checking of fuel tanks for leakages	During construction phase.
		1.8	All fuel and oil storage areas will have a	CC	PP	Ensure provision of	During camp set-up

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
			secondary containment to prevent soil contamination in case of leaks or spills.			Secondary containment	and construction activity.
		1.9	Photographs will be taken before any activity to record the conditions of site at locations that are likely to undergo soil erosion. Similar photographs will be taken after restoration, where applicable.	CC	PP	Take photographs before and after construction activity to monitor any change and soil conditions.	During all project activities
		1.10	A Waste Management plan will be followed to deal with spills.	CC	PP	Development of Waste Management plan and its implementation	During construction phase
2.	Water Resources	2.1	Water consumption for each project activity will be recorded.	CC	PP	Check water consumption records	During construction phase
		2.2	Develop and follow a project-specific oil spill contingency plan.	CC	PP	Check compliance	During construction phase
		2.3	Water conservation programme will be followed to prevent wastage of water.	CC	PP	Development of water management plan and its implementation, check compliance	Construction planning and design phase / during construction phase
		2.4	Follow good housekeeping practices with all machinery that may potentially discharge into or come in contact with the surface water.	CC	PP	Check housekeeping practices	During construction phase
		2.5	Fuels and lubricants will be stored in areas with impervious floors that can contain spills.	CC	PP	Check compliance	During construction phase
		2.6	All areas containing potentially hazardous materials will be isolated and contained.	CC	PP	Check compliance	During construction phase
3	Air Pollution,	3.1	All equipment, generators, and vehicles	CC	PP	Check compliance	During all project

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
	GHG Emissions		used during the project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions.				activities
		3.2	Imposing speed limits and encouraging more efficient journey management will reduce the dust emissions produced by vehicular traffic.	CC	PP	Visually check dust emissions	During Construction phase
		3.3	All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.	CC	PP	Visually check smoke and emissions	During all project activities
4.	Construction Noise	4.1	All on-site personnel will use required personal protective equipment (PPE) in high noise areas that will be clearly marked.	CC	PP	Check compliance	During construction and fabrication of plant activities
		4.2	Equipment noise will be reduced at source by proper design, maintenance and repair of construction machinery and equipment.	CC	PP	Monitor compliance and periodic noise monitoring	Prior to start and during construction phase
		4.3	Noise-abating devices will be used wherever needed and practicable.	CC	PP	Monitor compliance and periodic noise monitoring	Planning and design of construction phase
		4.4	Movement of all project vehicles and personnel will be restricted within work areas.	CC	PP	Check compliance	During all project activities
5.	Waste Management	5.1	Waste management plan will be followed while key elements of the waste management system will be the following in below sections:	CC	PP	Check compliance	During construction phase

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
		5.2	Separate bins will be placed for different type of wastes - plastic, paper, metal, glass, wood, and cotton.	CC	PP	Monitor compliance	During construction phase
		5.3	Recyclable material will be separated at source. The recyclable waste will be sold to waste contractors for recycling.	CC	PP	Recycle waste disposal records	During construction phase
		5.4	No waste will be dumped at any location outside the plant boundary.	CC	PP	Monitor compliance	During construction phase
		5.5	On-site audits of the waste management will be undertaken on a regular basis during the period of project activity.	CC	PP	Onsite waste management audit	During construction phase
		5.6	All waste will be collected and segregated for reuse, recycling or disposal.	CC	PP	Check compliance	During construction phase
		5.7	Segregate hazardous wastes and remove to a suitable, licensed facility depending on the best environmental option.	CC	PP	Check compliance	During construction phase
		5.8	Records of all waste generated during the project activity period will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a waste tracking register.	CC	PP	Check record/ waste tracking register	During construction phase
		5.9	All non-hazardous waste material that cannot be recycled or reused will be disposed-off as per waste management plan.	CC	PP	Check compliance	During construction phase
		5.10	Depending on the nature and quantity of the hazardous waste, it will be disposed of by licensed hazardous waste	CC	PP	Check compliance	During construction phase

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
			contractors as per the waste management plan.				
		5.11	Recyclable waste will be disposed of via approved waste contractors	CC	PP	Check compliance	During construction phase
		5.12	Audits of the waste disposal contractors and waste disposal facilities will be undertaken on a regular basis to check that procedures are being followed.	PP		Waste contractor audit	During construction phase
		5.13	Training will be provided to personnel for identification, segregation, and management of waste.	CC	PP	Conduct periodic training and maintain training record.	During construction phase
		5.14	An emergency response plan will be developed for the hazardous waste (and substances).	CC	PP	Develop and implement emergency response plan.	During construction phase
		5.15	All containers of hazardous waste will be labeled.	CC	PP	Check compliance	During construction phase
6.	Vehicle Movement	6.1	Journey management plan will be developed in accordance with Premier Motors Limited procedures.	CC	PP	Check compliance	During construction phase
		6.2	Existing tracks will be used wherever possible.	CC	PP	Check compliance	During construction phase
		6.3	Project vehicles will follow the speed limits prescribed by Premier Motors Limited. Drivers will receive specific training on this requirement.	CC	PP	Check compliance	During construction phase
7.	Disturbance to Wildlife	7.1	Vegetation loss will be kept to an absolute minimum. Large bushes and areas of dense vegetation will be avoided. Trees will not be felled.	CC	PP	Check compliance	During construction phase

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
		7.2	Ensure that a 'no-hunting, no-trapping, no-harassing. Wildlife policy will be strictly observed, unless threatening to human life.	CC	PP	Check compliance	During construction phase
		7.3	Food wastes will not be disposed of in the open.	CC	PP	Check compliance	During construction phase
		7.4	Wildlife protection rules will be included in trainings.	CC	PP	Monitor compliance	During construction phase
		7.5	Incident record of all damage or harm to the wildlife will be maintained.	CC	PP	The record will include the identification of species; location of incident; harm; person(s) responsible; explanation of violation; measures taken to prevent reoccurrence of the event; photographs, if available.	During construction phase
		7.6	Movement of all project personnel will be restricted to work areas;	CC	PP	Check compliance	During construction phase
8.	Clearing of natural Vegetation	8.1	Camp sites will be located in existing clearing. Vegetation clearing from these sites will be kept to a minimum.	CC	PP	Check compliance	During construction phase
		8.2	When developing new tracks, routes that minimize vegetation loss will be chose and unnecessary damage to vegetation will be avoided;	CC	PP	Check compliance	During construction phase
9.	Socioeconomic / Local community	9.1	All community grievances will be recorded and maintained in a Community Complaint's Register. In	CC	PP	Check the provision of complaint register and its access for communities	During construction phase

No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
			addition to this close liaison will be maintained between the community and the site representatives of Premier Motors Limited throughout the project activities				
		9.2	Maximum number of unskilled and semi-skilled jobs will be reserved for the local communities.	CC	PP	Check compliance	During construction phase
		9.3	Communities will be informed about the project activities and possible disturbance in advance.	CC	PP	Check compliance	During construction phase
		9.4	Awareness and cultural inductions to educate the contractor workforce on the requirement of minimizing social interaction with local communities;	CC	PP	Check compliance	During construction phase
		9.5	Unnecessary interaction of local population with the non-local project staff will be avoided.	CC	PP	Check compliance	During construction phase
		9.6	Discharging firearms will be explicitly prohibited.	CC	PP	Check compliance	During construction phase
		9.7	A local labor selection criterion will be developed which will be based primarily on merit and on equitable job distribution among the locals.	CC	PP	Monitor adherence with the criteria	Construction planning and design phase / During construction phase

CC = Construction/Commissioning Contractor, **PP** = Project Proponent

Table 8-2: Environmental Management Plan for Operation Activities

No	Impact		Mitigation Measures	Responsibility	Monitoring
1.	Air Emissions (Body Shop with Welding and Joining Operations)	1.1	Avoid or reduce oil film on the welded surfaces;	PP	Monitor compliance
		1.2	Reduce expulsion with spot welding;	PP	Monitor compliance
		1.3	Avoid short-time conditions with spot welding, changing over to medium-time conditions;	PP	Monitor compliance
		1.4	Place containers with welded small parts in the totally enclosed cabinets connected to exhaust system to avoid residual welding smoke release into the building;	PP	Monitor compliance
		1.5	General ventilation is needed to dilute pollutants not captured by the local and to dilute fumes generated after welding;	PP	Monitor compliance
		1.6	General ventilation systems make-up air to replace air extracted by local and general exhaust systems;	PP	Monitor compliance
	Air Emissions (Paint Shop)	1.7	The exhaust air from the spray booth will have to be treated by a venturi wet scrubber or any other paint overspray collector in order to collect paint overspray particles;	PP	Monitor compliance
		1.8	Ventilation; Ventilation systems in paint shops typically consist of general supply and exhaust systems. The major objectives of the paint shop building ventilation system are; Provide required make-up air for process; Maintain proper building pressurization; Maintain comfort for occupants in the building; Provide adequate ventilation air for the occupants	PP	Monitor compliance
		1.9	Coordination between process and building ventilation; Make-up air and exhaust air to and from paint booths and oven are provided by process ventilation systems. HVAC systems design of the “clean room” areas and spot cooling of workers on inspection, repair and preparation decks is also responsibility of process engineers;	PP	Monitor compliance
		1.11	General Supply Systems; General ventilation supplies 100% outdoor air. The supply air flow rate should exceed the make-up air flow for booths and ovens and be	PP	Monitor compliance

No	Impact		Mitigation Measures	Responsibility	Monitoring
			sufficient for building pressure management. General ventilation supply units are located on the building roof or in a penthouse. General exhaust systems typically include roof mounted exhaust fans located in the oven area, laydown area and phosphate area as required to maintain the building air balance;		
		1.12	Air distribution; Air should be supplied into the lower zone (at the floor level where possible) with air diffusers installed evenly along the shop. However, in nearly all paint shops some dumping of air is unavoidable, due to process restrictions;	PP	Monitor compliance
	Air Emissions (Assembly Area)	1.13	Ventilation systems in the assembly shop typically consist of local exhaust ventilation systems to control vehicle exhaust and contaminant emissions from contaminant producing areas. General ventilation is needed to dilute the contaminants released into the building that are not captured by local ventilation systems. General ventilation systems supply make up air to replace air extracted by local exhaust systems;	PP	Monitor compliance
		1.14	Windshield Gluing Station Ventilation The vapors produced by this manual process are captured by back draft or downdraft hood;	PP	Monitor compliance
		1.15	Door Seals and Trim Stations Ventilation Local exhaust system use to capture the vapors produced by this manual process is similar to those used at the windshield gluing station: back draft or downdraft hood;	PP	Monitor compliance
		1.16	Chassis Alignment Inspection Station Ventilation – The ventilation technique to properly ventilate the exhaust gases and evaporation of fluids off the vehicle is typically handled with a combination system. The pit where plant personnel are located is customarily ventilated through an in-floor method. Vehicle exhaust gases should be removed through the means of a source capture hose extraction system;	PP	Monitor compliance
		1.17	Paint Rework Station Ventilation – The ventilation technique to properly ventilate this area is through the use of a combination system consisting of horizontal flow push pull hoods along with a fume extractor arm with built in work lighting;	PP	Monitor compliance

No	Impact		Mitigation Measures	Responsibility	Monitoring
2.	Noise	2.1	Noise control devices will be used such as noise barriers and deflectors for high noise impact activities.	PP	Periodic noise level surveys at various sources and locations
		2.2	The noise producing equipment will be placed inside the acoustic enclosures to reduce noise at source.	PP	
		2.3	All equipment with potential of noise generation will be well maintained.	PP	
		2.4	PPEs will be provided to persons working in close proximity. Before the start of the operations conduct a noise survey of the equipment and prepare a noise control plan.	PP	
3.	Water Resources	3.1	Identification, regular measurement, and recording of principal flows within a facility	PP	
		3.2	Water measurement (metering) should emphasize areas of greatest water use. Based on review of metering data, 'unaccounted' use–indicating major leaks at industrial facilities–could be identified	PP	Monitor compliance
		3.3	A water management plan will be developed. The plan will also include strategies to minimize water use (and therefore volume of discharge) and maintain reserves; The essential elements of a water monitoring and management program involve	PP	Monitor compliance
		3.4	Follow good housekeeping practices with all machinery that may potentially discharge wastewater;	PP	Monitor compliance
		3.5	No untreated effluents will be released to the environment;	PP	Monitor compliance
4.	Waste Water	4.1	Effluent Treatment Plant: A modern effluent treatment facility will be provided to treat all these streams. The treatment plant will be based on technology Moving Bed Biofilm Reactor (MBBR) which is a highly effective treatment process consist of combination of conventional activated sludge process and biofilm media. The design scale of effluent treatment facilities is 250,000 gallons/day, and it uses "oil separation, flotation, A/O biochemical reaction, high density coagulation sedimentation and multimedia-filtration" process. The treated water will be reused into the circulating the water plant. • Ensure no wastewater run out from the paint booth while washing and other	PP	Provision of wastewater treatment plant at design phase/Monitor

No	Impact		Mitigation Measures	Responsibility	Monitoring
			activities takes place, waste stream should be connected to wastewater treatment plant. • Sludge should be separated from the wastewater and consider hazardous waste and disposed of environmental friendly with the third-party certification. • In the basic design and detailed design stage, the selection of measurement, regulation and control instrumentation valves will give full consideration to the use of water-saving instruments and related valves;		compliance Monitor compliance / wastewater sampling and testing records
		4.2	Wastewater Recycling: According to the principle of clean & waste water diversion and wastewater recycling, the wastewater of the automotive industrial wastewater will be able to be recycled in the process. After stripping, the most water is used into the process facilities, and the rest flows into the effluent treatment plant. The wastewater in the whole automotive industry is treated in the effluent treatment plant to achieve the standard for reuse in gardening and other purposes. The treated water is as a part of makeup water, and reuse into the circulating water plant.	PP	
5.	Soil Contamination	5.1	Material should never be poured directly from drums to small containers;	PP	Monitor compliance
		5.2	Secondary containment should be provided in order to prevent the soil contamination;	PP	
		5.3	Spigots or pumps should always be used to transfer waste materials to storage containers;	PP	
		5.4	Do not handle chemicals with bare hands, no matter how harmless you may think they are;	PP	
		5.5	After handling chemicals, hands should be washed prior to eating or drinking;	PP	
		5.6	Chemicals that can produce fumes, dusts should always be handled in a well-ventilated area. Use of containment devices such as fume hoods, and gas cabinets is particularly advisable. A fume hood, glove box or other appropriate exhaust ventilation is necessary when handling particularly hazardous substances;	PP	
		5.7	Do not eat and drink while working with chemicals;	PP	
		5.8	Do not light a match or smoke tobacco close to inflammable chemicals;	PP	

No	Impact		Mitigation Measures	Responsibility	Monitoring
		5.9	Use appropriate devises like funnels or spatulas when transferring chemicals from one container to another or when mixing chemicals;	PP	
		5.10	Keep work surfaces and containers clean;	PP	
		5.11	Use corrosion-resistant tools and equipment;	PP	
6.	Solid Waste Management	6.1	Return packaging of hazardous and non-hazardous materials (wherever possible), such as empty drums, to supplier for reuse;	PP	Monitor compliance
		6.2	Recycle packaging wherever possible;	PP	
		6.3	Develop and implement a waste management plan covering all aspects of waste treatment on site. Wherever possible, priority should be given to reduction of waste generated, and recovery and re-use of raw materials;	PP	
		6.4	Separate bins will be placed for different types of wastes-plastic, paper, metal, glass, wood and cotton;	PP	
		6.5	Recyclable material will be separated at source. The recyclable waste will be sold to waste contractors for recycling;	PP	
		6.6	No waste will be dumped at any location outside the project boundary;	PP	
		6.7	All hazardous waste will be separated from other wastes. Hazardous wastes will be stored in designated areas with restricted access and proper marking. Hazardous wastes will be disposed-off through approved waste contractors;	PP	
		6.8	Surplus materials including partially filled chemical and paint containers will be returned to suppliers. Inert wastes will be disposed-off onsite as filled material;	PP	
		6.9	Records of all waste generated will be maintained. Quantities of wastes disposed, recycled, or reused will be logged on a waste tracking register;	PP	
		6.10	Training will be provided to personal for identification, segregation and management of waste;	PP	
7.	Transportation	7.1	Vehicle road worthiness certification and vehicle fitness certificate will be ensured;	PP	Monitor compliance

No	Impact		Mitigation Measures	Responsibility	Monitoring
	and Traffic	7.2	Traffic management plan will be developed;	PP	
		7.3	Transportation safety plan will be established for operations	PP	
8.	Occupational Health & Safety	8.1	Heat stress injuries can be prevented through the implementation of an effective heat stress program	PP	Monitor compliance
		8.2	An Occupational Health and Safety Plan that should include specific job-related risk (maintenance of air quality levels of contaminant, dust vapors and gases for workers in close proximity to paint storage tanks and recommend limits). In addition, the Management Plan should provide a means of training workers in the use of the available information on substances from Materials Safety Data Sheet.	PP	
		8.3	Protection measures should include worker training, work permit systems, use of PPE, and fire alarms.	PP	
		8.4	Protective and preventative measures should be introduced to eliminate or disrupt source-pathway-receptor relationships. This can be achieved by eliminating the hazard, controlling the hazard, minimizing the hazard and providing appropriate personal equipment (PPE).	PP	
		8.5	Train workers in correct use of machinery and safety devices.	PP	
		8.6	Ear plugs and Ear muff will be used in high noise areas.	PP	

PP = Project Proponent

O&M Contractor = Operation & Maintenance Contractor

Table 8-3: Site Specific Biodiversity Action Plan

Sr No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
1.	Disturbance to Wildlife	1.1	Vegetation loss will be kept to an absolute minimum.	CC, O&M	PP	Check compliance	During all project activities
		1.2	Ensure that a 'no-hunting, no-trapping, no-harassing. Wildlife policy will be strictly observed, unless threatening to human life.	CC, O&M	PP	Check compliance	During all project activities
		1.3	General awareness of the crew will be enhanced regarding the wildlife, through environmental training, notice board postings, tool box talks etc.	CC, O&M	PP	Check compliance	During all project activities
		1.4	The total duration of activities will be minimized by good management	CC, O&M	PP	Check compliance	During construction activities
		1.5	Food wastes will not be disposed of in the open.	CC, O&M	PP	Check compliance	During all project activities
		1.6	Incident record of all damage or harm to the wildlife will be maintained.	CC, O&M	PP	The record will include the identification of species; location of incident; harm; person(s) responsible; explanation of violation; measures taken to prevent reoccurrence of the event; photographs, if available.	During all project activities
		1.7	Movement of all project personnel will be restricted to work areas;	CC, O&M	PP	Check compliance	During all project activities
		1.8	Night travelling will be kept to a minimum	CC, O&M	PP	Check compliance	During all

Sr No	Impact		Mitigation Measures	Responsibility		Action/Monitoring Parameter/Monitoring Method	Timing
				Execution	Monitoring		
							project activities
2.	Clearing of Natural Vegetation	2.1	Camp sites established will be located in existing clearing. Vegetation clearing from these sites will be kept to a minimum.	CC, O&M	PP	Check compliance	During construction activities
		2.2	When developing new tracks, routes that minimize vegetation loss will be chose and unnecessary damage to vegetation will be avoided;	CC, O&M	PP	Check compliance	During construction activities

CC = Construction/Commissioning Contractor
O&M Contractor = Operation & Maintenance Contractor
PP = Project Proponent

8.6 Environmental Monitoring and Reporting

Environmental monitoring can be categorized into two types; 1)- compliance monitoring and 2) - effects monitoring. The environmental monitoring programme is summarized in **Table 8.4.**

8.6.1 Compliance Monitoring

Compliance monitoring will be carried out to ensure compliance with the requirements of the EIA. The objectives of the EIA compliance monitoring will be to:

- Systematically observe the activities undertaken by the contractors or any other person associated with the project.
- Verify that the activities are undertaken in compliance with the EIA and other conditions identified by Premier Motors Limited.
- Document and communicate the observations to the concerned person(s) at Premier Motors Limited so that any corrective measures, if required, can be taken in a timely fashion.
- Maintain a record of all incidents of environmental significance and related actions and corrective measures.

Compliance monitoring will be the responsibility of all teams involved in the operation i.e. Premier Motors Limited and the contractors. Premier Motors Limited staff and contractors will carry out the inspections on a routine basis. This will also include routine monitoring of effluent and emissions and automotive complex operational parameters to ensure effective operations of plant and auxiliary systems.

8.6.2 Effects Monitoring

To monitor actual impacts of the project on selected sensitive receptors so that impacts not anticipated in the EIA or impacts which exceed the levels anticipated in the EIA can be identified and appropriate mitigation measures can be adopted in time. This objective will be achieved through Effects Monitoring.

Considering the environmental conditions of the project area and the assessment of potential impacts of the project made in the EIA, the following monitoring programme will be undertaken:

- Ambient Air Quality – The monitoring will be carried out at key locations covering both environmental receptors and workers occupational exposures.
- Stack Emission Monitoring – the monitoring will be carried out as per SMART rules and monthly reporting to EPA.
- Effluent sampling and analysis – analysis of priority parameters and monthly reporting to EPA.
- Noise – measurement of noise levels within the plant and the surroundings (plant boundary) will be carried out on a quarterly basis to ensure that the noise levels are with the standards stated in the EIA.
- Groundwater –as a good environmental practice, groundwater monitor wells may be established around the evaporation ponds to monitor any unlikely change in groundwater properties.

Table 8-4: Environmental Monitoring Program for Construction & Operation Phase

Phase	*Environmental Component*	*Monitoring*	*Standards*	*Frequency*
Construction Phase	Air Quality	Generator Stack emission monitoring	NEQS	Monthly monitoring following NEQS for Generator & Vehicular Emissions during construction phase Quarterly Ambient Air Quality monitoring for parameters consistent with NEQS during construction
		Vehicle emissions monitoring	NEQS	
		Ambient Air Quality monitoring	NEQS/Best Industrial practices	
	Noise Quality	Construction activity areas and 7.5meters away from construction equipment	Noise Level dB(A) NEQS, Guidelines	Monthly monitoring following during construction stage
	Wastewater	Outlet of camp water and pits water	Chemical analysis of wastewater for priority parameters as per SMART rules and monthly reporting to EPA.	Monthly during construction
	Solid Waste	Collection, handling and disposal to designated areas/borrow pits	Observations on solid waste type, quantity and disposal arrangement	Monthly during construction
	Occupational Safety	Construction activities	Visual observations and recording hazard/accident	Monthly during construction
	Accidental risk at site	Construction site	Visual observations recording accidents during construction of the road	Monthly during construction

Phase	Environmental Component	Monitoring	Standards	Timings & Parameters
Operational Phase	Air Quality	Stack/Exhaust emission Monitoring - Generator - Process Exhaust - Shops Exhaust - Oven Stack	Recommended Parameters - CO - SO2 - NOx - PM - Smoke	Quarterly monitoring of air pollutants during operational phase.
		Indoor Air Quality - Press Shop - Body Shop - Paint Shop - Assembly Shop - Performance Inspection	Recommended Parameters - CO - SO2 - NOx - PM - VOC	Quarterly monitoring of air pollutants during operational phase.
		Vehicle emissions monitoring	NEQS	Vehicle emissions monitoring following NEQS.
	Noise	Ambient noise monitoring	NEQS, Guidelines	Quarterly monitoring during operation phase.
	Wastewater	Outlet of the wastewater treatment system	Recommended Parameters - pH - Total Suspended Solids (TSS) - COD - BOD - Oil & Grease - Phenolic Compound	Quarterly monitoring during operation phase.

Phase	Environmental Component	Monitoring	Standards	Timings & Parameters
Operational Phase	Solid Waste	All over the plant facility	Observations on solid waste type, quantity and disposal arrangement	Monthly Monitoring
	Occupational Safety	At Project Site	Visual observations and recording hazard/accident	Monthly Monitoring
	Occupational Risk	At Project Site	Visual observations accident records of fire hazards, safety protocols, spill on land water	Monthly Monitoring

8.7 Communication and Documentation

An effective mechanism for storing and communicating environmental information during the project is an essential requirement of an EMP. The key features of such a mechanism are:

- Precise recording and maintenance of all information generated during the monitoring.
- Communicating the information to a central location
- Processing the information to produce periodic reports
- Providing information and answering queries on monitoring originating from various researchers and stakeholders.

8.7.1 Meetings and Reports

The following HSE meetings will take place during the project:

- Kick-off meeting
- Daily meetings
- Weekly meetings

The purpose of the kick-off meeting will be to present the environmental management plan to the senior staff of the project team, contractors and stakeholders and discuss its implementation.

A daily meeting will be held to discuss the environmental conduct of the operation, non-compliances noted by the field HSE Coordinator, and their remedial measures. Minutes of the meeting will be recorded in the form of action tracking register.

The purpose of the weekly HSE meeting will be to review the weekly performance of the operation by reviewing the number of non-conformances and the environmental incidents that occurred during the week, progress on daily action items, and to agree recommendations for additional controls, mitigation measures or monitoring requirements. The meeting will be recorded in the form of a weekly HSE report.

The report will be communicated to the Premier Motors Limited HSE Coordinator and senior members of the contractors. The report will include:

- Summary of weekly project activities.

- Non-compliances observed and mitigation measures taken or required.

Contractors will produce weekly and monthly HSE reports.

8.7.2 Social Complaints Register

The Premier Motors Limited Field HSE Coordinator will maintain a register of complaints regarding environment received from local communities and measures taken to mitigate these concerns. All community complaints received will be sent to the Premier Motors Limited HSE Manager for further action.

8.7.3 Change Record Register

All changes to the EMP or the project will be handled through the Change Management Plan provided in the EMP. These changes will be registered in a Change Record Register which will be maintained at the site to document any

8.7.4 Photographic Record

Premier Motors Limited will maintain a photographic record of all areas to be used during the project. As a minimum, the photographic record will include the photographs of project areas prior to and after construction activities (restoration). The photograph record will also be maintained for any noncompliance observed during the project.

8.7.5 Audit Reports

Premier Motors Limited will keep a record of all audits and inspections commissioned or undertaken by the company to check conformance with the EMP.

8.8 Change Management Plan

The EIA for the proposed operation recognizes that changes in the operation or the EMP may be required during the operation and therefore provides a Change Management Plan to manage such changes. The management of changes is discussed under two separate headings, Additions to the EMP and Changes to the Operation and the EMP.

8.8.1 Changes to the EMP

The EIA and the EMP have been developed based on the best possible information available at the time of the EIA study. However, it is possible that during the conduct of the proposed project, additional mitigation measures based on the findings of

environmental monitoring during the operation may have to be included in the EMP. In such cases following actions will be taken:

- A meeting will be held between Premier Motors Limited and the concerned contractor. During the meeting, the proposed addition to the EMP will be discussed and agreed upon by all parties.
- Based on the discussion during the meeting, a change report will be produced collectively, which will include the additional EMP clause and the reasons for the addition.
- The report will be signed by all parties and will be filed at the site office. A copy of the report will be sent to Premier Motors Limited and contractor head offices.
- All relevant project personnel will be informed of the addition.

8.8.2 Changes to the Operation

The change management system recognizes three orders of changes:

First Order

A first order change is one that leads to a significant departure from the project described or the impacts assessed in the EIA and consequently require a reassessment of the environmental impacts associated with the change. Action required in this case will be that the environmental impacts of the proposed change will be reassessed by Premier Motors Limited and sent to the Balochistan Environmental Protection Agency (BEPA) for approval.

Second Order

A second order change is one that does not result in the project description or impacts that are significantly different from those in the EIA. Action required for such changes will that Premier Motors Limited site representative will reassess the impact of the activity on the environment and specify additional mitigation measures if required and report the changes to Balochistan Environmental Protection Agency (BEPA).

Third Order

A third order change is one that does not result in impacts above those already assessed in the EIA, rather these may be made on site to minimize the impact of an activity. The only

action required for such changes will be to record the change in the Change Record Register.

8.9 Environmental Training

Environmental training will help to ensure that the requirements of the EIA and EMP are clearly understood and followed by all project personnel throughout the project period.

Environmental training will form part of the environmental management system. The training will be directed towards all personnel for general environmental awareness.

8.9.1 Objectives of the Training Programme

The key objective of training programme is to ensure that the requirements of the EMP are clearly understood and followed throughout the project. The trainings to the staff will help in communicating environmental related controls specified in the EIA and EMP.

8.9.2 Roles and Responsibilities

Premier Motors Limited HSE Coordinator and the contractor's HSE Coordinator will primarily be responsible for providing HSE training to all project personnel on potential environmental issues of the project. Contractor will prepare a project specific training manual for this purpose. Contractors on their part will be required to provide induction training/ briefing to all their staff before the start of any activity in the project area.

8.9.3 Training log

A training log will be maintained by Premier Motors Limited and contractors. The training log will include;

- Topic
- Date, time and location
- Trainer
- Participants

8.9.4 Training Needs Assessment

In addition to the training specified in the training log special/ additional trainings will be provided during the project activity. The criteria to assess the need of training will be based on the following:

- When a specified percentage of staff is newly inducted in the project;
- When any non-compliance is repeatedly reported, refresher training will be provided regarding that issue;
- When any incident/accident of minor or major nature occurs;
- Arrival of new contractor / sub contractor;
- Start of any new process / activity.

8.9.5 Training Material

Premier Motors Limited Field HSE Representative and the contractor's HSE Advisor will develop and prepare training material regarding HSE awareness, EIA, EMP and controls to be followed during the project. Separate training material will be prepared for each topic. A generic scope of the training which covers the requirements of the EIA and the EMP is discussed below in **Table 8.5.**

Table 8-5: A General Scope of Training Program

Staff	*Contents*	*Schedule*
Selected management staff from Premier Motors Limited and contractors	Introduction to project EIA and EMP. EMP communication, documentation and monitoring and reporting requirements. Key findings of the EIA, Mitigation measures, EMP, Social and cultural values of the area	Prior to the start of the project activities
All site personnel (including locally hired staff)	Environmental sensitivity of the project area, Wildlife and vegetation sensitivity of the project area, Mitigation measures, Contingency plan Waste disposal Community issues Social and cultural values	Prior to the start of the project activities
Construction supervisors	EMP communication, documentation and monitoring requirements. Good construction practices. Dust emissions control during construction phase.	Prior to start of construction activities
O & M Contractor's supervisory staff	EMP communication, documentation and monitoring requirements.	Prior to start of operation of proposed project

Staff	*Contents*	*Schedule*
Emergency response teams	Firefighting. Emergency response including oil and chemical spill.	Prior to start of operation of proposed project
Drivers	Road safety Road restrictions Vehicle restriction Defensive driving Cultural values and social sensitivity	Before and during the field operations
Camp staff	Camp operation Waste disposal Housekeeping	Before and during the field operations
Restoration teams	Restoration requirements Waste disposal Oil spill contingency plan.	Before the start of the restoration activities

8.10 Restoration and Rehabilitation – Construction & Commissioning Phase

Once the entire construction and commissioning operation is completed, restoration and rehabilitation of the campsites will be undertaken. Site restoration will follow Premier Motors Limited internal procedures but the general activities which will be carried out during site restoration are below:

For reference purposes, a photographic record of camp sites prior to set-up will be established. The following procedures will be adopted during site restoration and rehabilitation process:

- At the time of final demobilization all unused fuel, oil and chemical will be returned back to their suppliers;
- Materials that can be reused will be transported off site by the construction/demolition contractor;
- Demobilization of all construction equipment and machinery.
- All holes, ditches, and sumps not needed for future operations will be backfilled; an extra cap of soil will be added to cater for compaction.
- At the time of restoration, septic tanks will be removed and pits will be backfilled.
- It will be ensured that after restoration activities the campsites are clean and that no refuse has been left behind.
- Construction waste will be disposed off according to the waste management plan.

After work has been completed in the area, a restoration and rehabilitation team will be mobilized to ensure that the affected areas are left in a condition that is as close to their original state as possible. The team will ensure no construction related waste, debris or trash is left behind.

9 Conclusion

Based on the findings of the EIA Study,

- Operation of Premier Motors limited Auto Manufacturing Plant will on adoption of the mitigation measures, have no significant impact on the physical as well as socio-economic composition of the microenvironment and macro environment of the project area.
- The likely impact of construction and operation of the Premier Motors limited Automotive Manufacturing Plant will be appropriately mitigated through proven technologies, careful planning and landscaping. Mitigation will be assured by a program of environmental monitoring conducted to ensure that all measures are provided as intended, and to determine whether the environment is protected as envisaged. This will include observations on and off site, document checks, and interviews with workers and beneficiaries, and any requirements for remedial action will be reported to the EPA Balochistan.

The Study therefore recommends that the EIA should be approved with the condition that all mitigation measures recommended in EIA report, suggestions of stakeholders and recommendations of expert's committee will be adhered to by Premier Motors Limited and the legal requirements as well as the Environmental Management & Monitoring Plan shall be implemented in letter & Spirit.

The EIA is study based on baseline environmental and socioeconomic information which is collected from a variety of sources, including reports of previous similar studies, desk studies, field surveys, on-site monitoring, census reports etc. All adequate requirements have been addressed in this EIA report, which has a viable length covering the following:

- The proposed project activities;
- Environmental conditions of the proposed site and its surroundings;
- Legislative requirements related to the project;
- Significant environmental impacts of the proposed project activities on the physical, biological and socio-economic receptors;

- Mitigation measures to reduce any impact on physical, biological and socio-economic receptors;
- An EMP has been provided that will help in effective implementation of the mitigation measures.

This environmental study has fully examined the potential environmental impacts due to proposed project activities. Mitigation measures that required minimizing or obviating these impacts is also suggested.

It is therefore concluded that *"Proposed Premier Motors limited Automotive Manufacturing plant and its associated construction and operation work has a low intensity adverse impacts, likely to be of short term duration, minor and of local consequence and are insignificant. Carefully implementation of mitigation measures and Environmental Management Plan (EMP) will ensure that environmental impacts are managed and minimized and will be within acceptable limits."*

Moreover, proposed project activities will not lead to pose adverse environmental impacts, if suggested mitigation measure and EMP will implement effectively.

10 References

1. Ventilation Guide for Automotive Industry by International Task Force, 1st Edition 2000.
2. Balochistan Environmental Protection Act, 2012
3. Government of Pakistan. 1860. The Pakistan Penal Code.
4. Government of Pakistan. 1923. The Mines Act.
5. Government of Pakistan. 1975. The Antiquities Act.
6. Government of Pakistan. 1997. Pakistan Environmental Protection Act.
7. Government of Pakistan. 1997a. Guidelines for Public Consultation.
8. Government of Pakistan. 1997c. Guidelines for Preparation and Review of Environmental Report.
9. Government of Pakistan. 1997d. Policy and Procedures for Filing, Review and Approval of Environmental Assessments. Pakistan Environmental Protection Agency.
10. Pakistan Environmental Protection Agency Review of IEE and EIA Regulations, 2000.
11. Report Climate of Pakistan National Drought Monitoring Centre (NDMC)
12. Pakistan Metrological Department.
13. WHO Drinking Water Quality Guideline
14. The Convention on Conservation of Migratory Species of Wild Animals, 1979
15. The Convention on wetlands of International Importance, Ramsar 1971
16. International Union for Conservation of Nature and Natural Resources (IUCN) Red List 2000
17. National Environmental Quality Standards (NEQS) for Air, Water and Noise.

Annexure

Annexure

Annexure-I: EIA Project Team

Annexure-II: Balochistan Environmental Protection Act, 2012

Annexure-III: Pakistan EIA/IEE Regulations, 2000

Annexure-IV: National Environmental Quality Standards (NEQS)

Annexure-V: Environmental Monitoring Reports

Annexure-VI: List of Stakeholder Consultation & Survey Forms

Annexure-VII: Project Area -Topographic Map

Annexure-VIII: Geotechnical & Soil Study Report of Project Area

Annexure I

EIA Project Team

Annex - A: Project Team

Sr. #	Name	Expertise	Qualification & Experience	Role and Responsibility
1.	Ms. Tasneem Ilyas	Director Operations Mineral & Environmental Services	M.Sc., Chemistry Exp. 35 Years	EIA Expert and Technical Peer Review
2.	Syed Faseeh	Senior Manager EHS	Ph.D. Scholar, M.Sc. Environmental, M.Sc. Statistics & MBA Exp. 24 Years	Project Manager
3.	Mr. Fahad Saleem	Deputy Manager EIA Expert.	M.S Environment Studies, M.Sc. Petroleum Exp. 14 Years	EIA Report Reviewer
4.	Mr. Shamim Fakhri	Wildlife Expert	M.Sc. Zoologist, Exp. 25 Years	Fauna Baseline, Impact and Mitigation measures
5.	Mr. Muhammad Yousuf Kakar	Forest Expert – Ex. Chief Conservator of Forest Baluchistan.	M.Sc. Forestry Exp.40 Years	Flora Baseline, Impact and Mitigation measures
6.	Mr. Irfan Ali	Environmentalist	M.Sc. Environment Studies, Exp. 06 Years	Client coordination, Introduction, Environmental Baseline, Project Alternatives, Impact Assessment and Mitigation Measures, Environmental Management Plan, Technical Report Writing,
7.	Mr. Wajid Shah	Sociologist	M.Sc. Sociologist, Exp. 07 Years	Socio-economic baseline data collection, Public Consultation, Field Visits and Social Surveys,
8.	Mr. Muhammad Bilal	Physical Environmental	M.Sc. Geology, Exp. 03 Years	Field Visits and Surveys, Technical Report Writing
9.	Mr. Ashad Khan	Field Officer	M.Sc. Environmental Sciences, Exp. 03 Years	Environmental Monitoring, Water and Soil Sampling
10.	Mr. Ali Ahmed Khan	GIS Expert	M.Sc. Geography, Exp. 03 Years	Study maps development

Annexure II

Baluchistan Environmental Protection Act 2012

BALOCHISTAN PROVINCIAL ASSEMBLY SECRETARIAT

NOTIFICATION.

Dated Quetta, the 15th January, 2013.

No. PAB/Legis: V (9)/ 2013. The Balochistan Environment protection Bill, 2012 Bill No.9 of 2012 having been passed by the Provincial Assembly of Balochistan on 24th December, 2012 and assented to by the Governor, Balochistan on **9th January, 2013** is hereby published as an Act of the Provincial Assembly of Balochistan.

THE BALOCHISTAN ENVIRONMENT PROTECTION ACT 2012,

ACT NO. VIII OF 2012.

(First published after having received the assent of the governor of Balochistan in the Balochistan Gazette (Extra Ordinary) dated the 9th January, 2013.

AN

ACT

to provide for the protection, conservation, rehabilitation and improvement of the environment, for the prevention and control of pollution, and promotion of sustainable development

Preamble

Whereas, it is expedient to provide for the protection, conservation, rehabilitation and improvement of the environment, prevention and control of pollution, promotion of sustainable development, and for matters connected therewith and incidental thereto;

Short title, extent and commencement

1. It is enacted as follows:-

(1) *This Act shall be called the Balochistan Environmental Protection Act, 2012.*

(2) *It extends to the whole Province of Balochistan except Tribal Areas.*

(3) It shall come into force at once.

Definitions

2. In this Act, unless there is anything repugnant in the subject or context,

(a) adverse environmental effect" means impairment of, or damage to, the environment and includes—

(i) human health and property or biodiversity, coast, beaches and ecosystem;

(ii) pollution; and

(iii) any adverse environmental effect on Land, Air and Water;

(b) "Agricultural waste" means waste from farm and agricultural Activities including poultry, cattle farming, animal husbandry residues from the use of fertilizers, pesticides and other farm. chemicals;

(c) "Air pollutant" means any substance that causes pollution of air and includes soot, smoke, dust particles, odour, light, electro-magnetic, radiation, heat, fumes, combustion exhaust, exhaust gases, noxious gases, hazardous substances and radioActive substances;

(d) *"Alien species" means a species that does not occur naturally in Balochistan.*

(e) *"Balochistan coastline or coastal zone" means the territorial jurisdiction of the coastline of the Province of Balochistan.*

(f) *"Best prActicable environmental option" means the best method for preventing or minimizing adverse effects on the environment, having regard to, among other things:*
(i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects;
(ii) the financial implications, and the effect on the environment, of that option when compared with other options; and
(iii) the current state of technical knowledge and the likelihood that the option can be successfully applied.

(g) "Biodiversity" or "biological diversity" means the variability among living organisms from all sources, including inter alia terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part, including diversity within species, between species and of ecosystems;

(h) *"Clinical waste" means any waste produced by hospitals, clinics, nursing homes, doctor's offices, medical laboratories, medical research facilities and veterinarians which is infectious or potentially infectious.*

(i) "Council" means the Balochistan Environmental Protection Council established under section 3;

(j) "Discharge" includes spilling, leaking, pumping, depositing, seeping, releasing, flowing out, pouring, emitting, emptying or dumping;

(k) "Ecosystem" means a dynamic complex of plant, animal and micro-organism communities and their non- living environment interActing as a functional unit;

(l) "Effluent" means any material in solid, liquid or gaseous form or combination thereof being discharged from industrial Activity or any other source and includes a slurry, suspension or vapor;

(m) "Electronic waste" means discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television sets, Cathode ray tubes (CRT) and refrigerator, VCRs, stereos, copiers, and fax machines. It also includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal and electronic products nearing the end of their "useful life."

(n) "Emission standards" means the permissible standards established by the Provincial Agency for emission of air pollutants and noise and for discharge of effluent and waste;

(o) "Endemic and indigenous species" means a species which occurs naturally in the wild only in Balochistan, or a species which only breeds in the wild in Balochistan.

(p) "Environment" means—

(i) air, water and land;

(ii) all layers of the atmosphere;

(iii) all organic and inorganic matter and living organisms;

(iv) the ecosystem and ecological relationships;

(v) buildings, structures, roads, facilities and works;

(vi) all social and economic conditions affecting community life; and

(vii) the inter-relationships between any of the fActors specified in sub-clauses (i) to (vi);

(q) "Environmental impAct assessment" means an environmental study comprising collection of data, prediction of qualitative and quantitative impActs, comparison of alternatives, evaluation of preventive, mitigation and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed;

(r) "Environmental Magistrate" means the Magistrate of the First Class appointed under Section 32 ;

(s) "Environmental Tribunal" means the Balochistan Environmental Protection Tribunal constituted under section 28;

(t) "Exclusive Economic Zone" shall have the same meaning as in the Territorial Waters and Maritime Zones Act, 1976 (LXXXII of 1976);

(u) "FActory" means any premises in which industrial Activity is being undertaken;

(v) "Genetic Resource" means any material of plant, animal, microbial or other origin containing functional units of heredity of Actual or potential value.

(w)"Government" means the Government of Balochistan.

(x) "Government Agency" includes—

(i) a department, attached department, bureau, section, commission, board, office or unit of the Provincial Government;

(ii) a developmental or a local authority, company or corporation established or controlled by the Provincial Government; and

(iii) the Balochistan Environmental Protection Agency. ; and

(iv) any other body defined and listed in the Rules of Business of the Provincial Government.

(y) "Handling", in relation to any substance, means the manufActure, processing, treatment, package, storage, transportation, collection, destruction, conversion, offering for sale, transfer or the like of such substance;

(z) "Hazardous substance" means—

(i) a substance or mixture of substances, other than a pesticide as defined in the Agricultural Pesticides Ordinance, 1971 (II of 1971), which, by reason of its chemical Activity or toxic, explosive, flammable, corrosive, radioActive or other charActeristics, causes, or is likely to cause, directly or in combination with other matters an adverse environmental effect; and

(ii) any substance which may be prescribed as a hazardous substance;

(aa) "Hazardous waste" means waste which is or which contains a hazardous substance or which may be prescribed as hazardous waste and includes hospital waste and nuclear waste;

(bb) "Historic waters" means such limits of the waters adjacent to the land territory of Pakistan as may be specified by notification under section 7 of the Territorial Waters and Maritime Zones Act, 1976 (LXXXII of 1976);

(cc) "Hospital waste" includes waste medical supplies and materials of all kinds, and waste blood, tissue, organs and other parts of the human and animal bodies, from hospitals, clinics and laboratories;

(dd) "Industrial Activity" means any operation or process for manufActuring, making, formulating, synthesizing, altering, repairing, ornamenting, finishing, packing or otherwise treating any article or substance with a view to its use, sale, transport, delivery or disposal, or for mining, for oil and gas exploration and development, or for pumping water or sewage, or for generating, transforming or transmitting power or for any other industrial or commercial purpose;

(ee) "Industrial waste" means waste resulting from an industrial Activity;

(ff) "Initial Environmental Examination" means a preliminary environmental review of the reasonably foreseeable qualitative and quantitative impActs on the environment of a proposed project to determine whether it is likely to cause an adverse environmental effect for requiring preparation of an environmental impAct assessment;

(gg) "Integrated pollution control" means the holistic system aimed at pollution prevention and minimization at source, managing the impAct of pollution and waste on the receiving environment and remediation of damaged and polluted environments.

(hh) "Living modified organism" means any living organism that possesses a novel combination of genetic material obtained through the use of modern technology.

(ii) "local authority" means regional or district set up of EPA or any Agency designated by the Provincial Government, by notification in the official Gazette, to be a local authority for the purposes of this Act;

(jj) "Local council" means a local council constituted or established under a law relating to local Government;

(kk) "Motor vehicle" means any mechanically propelled vehicle adapted for use upon land whether its power of propulsion is transmitted thereto from an external or internal source, and includes a chassis to which a body has not been attached, and a trailer. but does not include a vehicle running upon fixed rails;

(ll) "Municipal waste" includes sewage, refuse, garbage, waste from abattoirs, sludge and human excreta and the like;

(mm) "Environmental Quality Standards" means standards established by the Federal/Provincial Agencies under clause (e) of sub-section (1) of section 6 and approved by the Council under clause (c) of sub -

section (1) of section 4;

(nn) "Noise" means the intensity, duration and charActer of sounds from all sources, and includes vibration;

(oo) "Nuclear waste" means waste from any nuclear reActor or nuclear plant or other nuclear energy system, whether or not such waste is radioActive;

(pp) "Person" means any natural person or legal entity and includes an individual, firm, association, partnership, society, group, company, corporation, co-operative society, Government Agency, non-governmental organization, community-based organization, village organization, local council or local authority and, in the case of a vessel, the master or other person having for the time being the charge or control of the vessel;

(qq) "Pollution" means the contamination of air, land or water by the discharge or emission of effluent or wastes or air pollutants or noise or other matter which either directly or indirectly or in combination with other discharges or substances alters unfavorably the chemical, physical, biological, radiation, thermal or radiological or aesthetic properties of the air, land or water or which may, or is likely to make the air, land or water unclean, noxious or impure or injurious, disagreeable or detrimental to the health, safety, welfare or property of persons or harmful to biodiversity;

(rr) "Prescribed" means prescribed by rules made under this Act;

(ss) "Project" means any Activity, plan, scheme, proposal or undertaking involving any change in the environment and includes—

(i) construction or use of buildings or other works;

(ii) construction or use of roads or other transport systems;

(iii) construction or operation of fActories or other installations;

(iv) mineral prospecting, mining, quarrying, stone-crushing, drilling and the like;

(v) any change of land use or water use; and

(vi) alteration, expansion, repair, decommissioning or abandonment of existing buildings or other works, roads or other transport systems, fActories or other installations;

(tt) "Protection of environment" means the qualitative and quantitative improvement of the different components of the environment and prevention of the deterioration of qualitative and quantitative standards;

(uu) "Proponent" means the person who proposes or intends to undertake a project;

(vv)"Provincial Agency" means the Balochistan Environmental Protection Agency established under section 5, or any Government Agency, local council or local authority exercising the powers and functions of the Provincial Agency;

(ww) "Rules &Regulations" means rules and regulation made under this Act;

(xx) "Sewage" means liquid or semi-solid wastes and sludge from sanitary conveniences, kitchens, laundries, washing and similar Activities and from any sewerage system or sewage disposal works;

(yy) "Ship breaking" means breaking up of various types of ship for recycling.

(zz) "Standards" means qualitative and quantitative standards for discharge of effluent and wastes and for emission of air pollutants and noise either for general applicability or for a particular area, or from a particular production process, or for a particular product, and includes the Environmental Quality Standards, emission standards and other standards established under this Act and the rules and regulations;

(aaa) "Strategic Environmental Assessment" Strategic environmental assessment (SEA) is a system of incorporating environmental considerations into policies, plans, programmes and strategies. It is sometimes referred to as strategic environmental impAct assessment.

(bbb) "Sustainable Development" means development that meets the needs of the present generation without compromising the ability of future generations to meet their needs;

(ccc) "Sustainable Management" means management of the use of natural resources to provide for the health, safety and social, cultural and economic well-being of people and communities taking into account the following:

(i) safeguarding the life-supporting capacity of natural resources and ecosystems;

(ii) ensuring the maintenance of the life-supporting capacity and quality of natural resources and ecosystems to meet the reasonably foreseeable needs of future generations;

(iii) avoiding the creation of adverse effects and, where adverse effects cannot be avoided, mitigates and remedies adverse effects.

(ddd) *"Territorial waters" shall have the same meaning as in the Territorial Waters and Maritime Zones Act, 1976 (LXXXII of 1976);*

(eee) "Vessel" includes anything made for the conveyance by water of human beings or of goods; and

(fff) "Waste" means any substance or object which has been, is being or is intended to be, discarded or disposed of, and includes liquid waste, solid waste, waste gases, suspended waste, industrial waste, agricultural waste, nuclear waste, municipal waste, hospital waste, used polyethylene bags and residues from the incineration of all types of waste.

(ggg) "Water resource" includes surface water, an aquifer or ground water , a river or spring, a natural channel in which water flows regularly or intermittently, and a wetland, lake or dam into which, or from which, water flows.

Establishment of the Balochistan Environmental Protection Council.—

3. (1) The Provincial Government shall, by notification in the official Gazette, establish a Council to be known as the Balochistan Environmental Protection Council consisting of—

(a) Chief Minister or such other person as the Chief Chairperson Minister may nominate in this behalf.

(b) Minister for Environment Vice chairperson

(c) Chief Secretary Balochistan Member

(d) Secretary Environment Member/Secretary

(e) Secretary Finance Member

(f) Secretary Industries	Member
(g) Secretary Agriculture	Member
(h) Secretary Forest	Member
(i) Secretary P&D	Member
(j) Secretary S&GAD	Member
(k) Director General EPA	Member

(l) Such other persons not exceeding six (6) as the Provincial Government may appoint, with the following representation:

One from the Balochistan Chamber of Commerce & Industries and one from the Balochistan Chamber of Agriculture, Two Environment experts/Scientist, One Educationist and One from Non Governmental Organization.

(2) The Members of the Council, other than ex-officio members, shall be appointed in accordance with the prescribed procedure and shall hold office for a term of two years.

(3) The Council may constitute committees of its members and entrust them with such functions as it may deem fit, and the recommendations of the committees shall be submitted to the Council for approval. The council or any of such committee may seek assistance from any Government Department or expert in the relevant environmental field in performance of its functions.

Functions and powers of the Council.—

4. (1) The Council shall:-

(a) co-ordinate and supervise enforcement of the provisions of this Act; and

(b) approve comprehensive environmental policies and ensure their implementation within the framework of a National /Balochistan conservation strategy as may be approved by the Federal/Provincial Government from time to time;

(c) approve the Environmental Quality Standards;

(d) provide guidelines for the protection and conservation of species, habitats, and biodiversity in general, and for the conservation of renewable and non-renewable resources.

(e) co-ordinate integration of the principles and concerns of sustainable development into development plans and policies;

(f) The Council shall frame its own rules of procedure.

(g) The Council shall hold meetings, as and when necessary, but not less than two meetings, shall be held in a year.

(2) The Council may direct the Provincial Agency or any Government Agency to prepare, submit or implement projects for the protection, conservation, rehabilitation and improvement of the environment and the sustainable development of resources or to undertake research in any aspect of environment.

Establishment of the Balochistan Environmental Protection Agency.

5. (1) The Government of Balochistan shall by a notification in the official Gazette established Balochistan Environmental Protection Agency to exercise the powers and perform the functions assigned to it under this Act and the rules and regulations made there under.

(2) The Balochistan Environmental Protection Agency shall be headed by a Director-General who shall be appointed by the Government of Balochistan on such terms and conditions as it may determine.

(3) The Balochistan Environmental Protection Agency shall have such administrative, technical and legal staff, as the Government of Balochistan may specify, to be appointed in accordance with Balochistan Civil Servant Act 1974.

(4) The powers and functions of the Balochistan Environmental Protection Agency shall be exercised and performed by the Director-General.

(5) The Director-General may, by general or special order, delegate any of the powers and functions to staff appointed under sub-section (3).

(6) For assisting the Balochistan Environmental Protection Agency in the discharge of its functions the Government of Balochistan shall establish Advisory Committees for various sectors and appoint as members thereof representatives of the relevant sector, educational institutions and non- governmental organizations.

Functions of the Balochistan Environmental Protection Agency

6. (1) The Balochistan Environmental Protection Agency shall—

(a) administer and implement this Act and the rules and regulations made; thereunder;

(b) prepare, in co-ordination with the relevant Government Agency and in consultation with the concerned sectors Advisory Committees, environmental policies for approval by the Council;

(c) take all necessary measures for the implementation of the national environmental policies approved by the Council;

(d) prepare and publish an Annual Environment Report on the state of the environment;

(e) establish standards for the quality of the ambient air, water and land, by notification in the official Gazette in consultation with the other relevant Government Departments/ Agencies.

(f) Revise the Environmental Quality Standards with approval of the Council:

Provided that

(i) before seeking approval of the Council, the Balochistan Environmental Protection Agency shall publish the proposed Environmental Quality Standards for public opinion in accordance with the prescribed procedure; and

(ii) different standards for discharge or emission from different sources and for different areas and conditions may be specified; where standards are less stringent than the Environmental Quality Standards prior approval of the Council shall be obtained;

(iii) certain areas, with the approval of the Council, may exclude from carrying out specific Activities, projects from the application of such standards;

(g) co-ordinate environmental policies and programmes;

(h) establish systems and procedures for surveys, monitoring, measurement, examination, investigation, research, inspection and audit to prevent and control pollution, and to estimate the costs of cleaning up pollution and rehabilitating the environment in various sectors;

(i) take measures to promote research and the development of science and technology which may contribute to the protection of the environment, and sustainable development;

(j) certify one or more laboratories as approved laboratories for conducting tests and analysis and one or more research institutes as environmental research institutes for conducting research and investigation for the purposes of this Act.

(k) initiate legislation in various sectors of the environment;

(l) render advice and assistance in environmental matters including such information and data available with it as may be required for carrying out the purposes of this Act:

Provided that the disclosure of such information shall be subject to the restrictions contained in the proviso to sub-section (3) of section 15;

(m) assist the local councils, local authorities, Government Agencies and other persons to implement schemes for the proper disposal of wastes so as to ensure compliance with the standards established by it;

(n) provide information and guidance to the public on environmental matters;

(o) recommend environmental courses, topics, literature and books for incorporation in the curricula and syllabi of educational institutions;

(p) promote public education and awareness of environmental issues through mass media and other means including seminars and workshops;

(q) specify safeguards for the prevention of accidents and disasters which may cause pollution, collaborate with the concerned person in the preparation of contingency plans for control of such accidents and disasters, and co-ordinate implementation of such plans;

(r) encourage the formation and working of non-governmental organizations, community organizations and village organizations to prevent and control pollution and promote sustainable development;

(s) perform any function which the Council may assign to it.

(2) The Balochistan Environmental Protection Agency may—

(a) undertake inquiries or investigation into environmental issues, either of its own accord or upon complaint from any person or organization;

(b) request any person to furnish any information or data relevant to its functions;

(c) initiate with the approval of the ***Provincial/Federal Government,*** requests for foreign assistance in support of the purposes of this Act and enter into arrangements with foreign agencies or organizations for the exchange of material or information and participate in international seminars or meetings;

(d) recommend to the Government of Balochistan the adoption of financial and fiscal programmes, schemes or measures for achieving environmental objectives and goals and the purposes of this Act, including—

(i) incentives, prizes awards, subsidies, tax exemptions, rebates and depreciation allowances; and

(ii) taxes, duties and other levies;

(e) establish and maintain laboratories to help in the performance of its functions under this Act and to conduct research in various aspects of the environment and provide or arrange necessary assistance for establishment of similar laboratories in the private sector;

(f) provide or arrange, in accordance with such procedure as may be prescribed, financial assistance for projects designed to facilitate the discharge of its functions.

Powers of the Balochistan Environmental Protection Agency

7. Subject to the provisions of this Act, *the Balochistan Environmental Protection Agency may*

(a) lease, purchase, acquire property both moveable and immovable;

(b) fix and realize fees, rates and charges for rendering any service or providing any facility, information or data under this Act or the rules and regulations;

(c) enter into contrActs, execute instruments subject to approval of the Provincial Government, necessary for proper management and conduct of its business made thereunder;

(d) subject to approval of the Provincial Government appoint in accordance with prescribed procedures such experts and consultants as it considers necessary for the efficient performance of its functions on appropriate terms and conditions;

(e) summon and enforce the attendance of any person and require him to supply any information or document needed for the conduct of any enquiry or investigation into any environmental issue;

(f) The Director General Balochistan EPA or any other Regional officer specifically authorized in this behalf by the Director

General shall have the power to impose fine/administrative penalty up to rupees one hundred thousand from case to case basis.

(i) the fine/administrative penalty shall be recovered as per land revenue Act.

(ii) the fine/administrative penalty initially or for an interim period shall be placed with the Balochistan EPA till the decision of the Environmental Tribunal or Magistrate; and

(iii) the fine/administrative penalty after the final decision shall be deposited in the public exchequer.

(g) enter and inspect and under the authority of a search warrant issued by the Environmental Court or Environmental Magistrate, search at any reasonable time, any land, building, premises, vehicle or vessel or other place where or in which. there are reasonable grounds to believe that an offence under this Act has been, or is being, committed;

(i) Subject to the provisions of this Act, any person generally or specifically authorized in this behalf by the Director General shall be entitled to enter, at all reasonable times, with such assistance as he considers necessary, any building or place for the following purposes, namely:-

a) to perform duties conferred on him under this Act or rules;

b) to inspect any Activity in such building or place in accordance with this Act, the rules or any notice, order or direction issued thereunder;

c) to examine or test any equipment, industrial plant, record, register or any other important matter relating thereto;

d) to conduct a search of any building or place which the said person has reason to believe to have been the place of occurrence of any offence in contravention of any notice, order or direction issued under this Act or the rules;

e) to seize/close any equipment, industrial plant, record, register, document or other matter which may serve as evidence of the commission of any offence punishable under this Act or the rules.

(ii) The provisions of the Code of Criminal Procedure shall be applicable in respect of any search or seizure under this Act.

(a) take samples of any materials, products, articles or substances or of the effluent, wastes or air pollutants being discharged or emitted or of air, water or land in the vicinity of the discharge or emission;

(b) arrange for test and analysis of the samples at a certified laboratory;

(i) Every person authorized in this behalf by the Director General may, in such manner as may be prescribed by rules, collect from any fActory, premises or place samples of air, water,

soil or of any other substance for the purpose of analysis.

(ii) The results of the analysis of samples collected under clause (i) shall not be admissible in evidence in any legal proceeding unless the provisions of the clauses (iii) and (iv) have been complied with.

(iii) Subject to the provisions of sub-section (4), the officer collecting a sample under clause (i) shall-

(a) serve notice on the owner or proponent or agent of the said place, in such manner as may be prescribed by rules, of his intention to collect such sample;

(b) collect the sample in the presence of the said occupier or agent;

(c) put the sample into a container and affix on it a seal bearing the signatures of himself and of the occupier or agent;

(d) prepare a report of the sample collected and sign it himself and take the signature of the occupier or agent;

(e) send without any delay, the said container to the laboratory specified by the Director General EPA.

(iv) Where a sample is collected under clause (i) and a notice is served by the collecting officer under sub clause a) of clause (iii), the collecting officer shall, if the occupier or agent willfully absents himself at the time of the collection of the sample or, though being present, refuses to sign the sample or report, in the presence of two witnesses, give his signature and attest and seal it and shall send it without any delay to the laboratory specified by the Director General, mentioning that the occupier or agent had not been present or, as the case may be, refused to give his signature.

(i) confiscate any article used in the commission of the offence where the offender is not known or cannot be found within a reasonable time:

Provided that the power under clauses (f), (h), (I) and (j) shall be exercised in accordance with the provisions of the Code of Criminal Procedure, 1898 (Act V of 1898). or the rules made under this Act and under the direction of the Environmental Tribunal or Environmental Magistrate; and

(j) establish an Environmental Co-ordination Committee comprising the Director-General as its chairman and the heads of relevant Government Agencies and such other persons as the Government of Balochistan may appoint as its members to exercise such powers and perform such functions as may be delegated or assigned to it by the Government of Balochistan for carrying out the purposes of this Act and for ensuring inter departmental co-ordination in environmental policies.

Establishment, powers and functions of the Regional or District Environmental Protection Agencies.—

8. (1) Government of Balochistan shall, by notification in the official Gazette, establish the Regional or District Environmental Protection Agency, to exercise such powers and perform such functions as may be delegated to it by the Government of Balochistan under sub-section (2) of section 34.

(2) The Regional or District Environmental Protection Agency shall be headed by an officer at least of the rank of regional Director or Deputy Director who shall be appointed by the Provincial Government on such terms and conditions as prescribed in the Balochistan Civil Servant Act 1974.

(3) The Regional or District Environmental Protection Agency shall have such administrative, technical and legal staff as the Government of Balochistan may specify, to be appointed in accordance with the Balochistan Civil Servants Appointment, Promotion and Transfers Rules 2009 such procedure as may be prescribed.

(4) The powers and functions of the Regional or District Environmental Protection Agency shall be exercised and performed by an Officer of the rank of regional Director or Deputy Director appointed as head.

(4) The Director General may, by general or special order, delegate any of the powers and functions to staff appointed under sub-section (3).

Establishment of the Balochistan Sustainable Development Funds.—

9. (1) There shall be established in the Province a Balochistan Sustainable Development Fund.

(2) The Balochistan Sustainable Development Fund shall be derived from the following sources, namely:—

(a) grants made or loans advanced by the Federal Government or the Provincial Government;

(b) aid and assistance, grants, advances, donations and other non-obligatory funds received from foreign governments, national or international agencies, and non-governmental organizations; and

(c) contributions from private organizations and other persons.

(3) The Balochistan Sustainable Development Fund shall be utilized in accordance with such procedure as may be prescribed for—

(a) providing financial assistance to the projects in the public/private sector designed for the protection, conservation, rehabilitation and improvement of the environment, the prevention and control of pollution, the sustainable development of resources and for research in any aspect of environment; and

(b) any other purpose which in the opinion of the Board shall help to achieve environmental objectives and the purposes of this Act.

Management of the Balochistan Sustainable Development Fund.—

10. (1) The Balochistan Sustainable Development Fund shall be managed by a Board known as the Sustainable Development Fund Board consisting of:-

(i) Secretary Environment Department Chairperson

(ii) Secretary Industries Department Member

(iii) Secretary Social welfare Department Member

(iv) Secretary Finance Department Member

(v) Secretary Forest Department Member

(vi) Secretary Agriculture Department Member

(vii) such non-official persons not exceeding six (6) as the Members Government of Balochistan may appoint including two (2)representatives of the Balochistan Chamber of Commerce and Industry, two (2) representatives of the Balochistan Chamber of Agriculture and two (2) representative of leading non-governmental organizations/donors.

(viii) Director General, Balochistan Environmental Protection Agency Member/Secretary

(2) the Board shall have the power to—

(a) sanction financial assistance for eligible projects; as specified in section 9(3) of this Act

(b) invest moneys held in the Balochistan Sustainable Development Fund in such profit - bearing Government bonds, savings schemes and securities as it may deem suitable; and

(3) The Board shall constitute committees of its members to undertake regular monitoring of projects financed from the Balochistan Sustainable Development Fund and to submit progress reports to the Board which shall publish an Annual Report incorporating its annual audited accounts and performance evaluation based on the progress reports.

(4) Audit of the fund shall be conducted on annual basis.

Inter-Provincial Environmental issues:-

11. (1) The project falling within the geographical jurisdiction of two or more Provinces, the IEE or EIA may be submitted by the proponent to each Provincial Environmental Agencies for review and approval.

(2) In case of any dispute or concerns the matter shall be settled through mutual consultation of the Provinces to avoid any inconveniences or future litigation.

(3) The concerned Provinces may constitute a joint technical or review committee including a representative of the concerned Federal Ministry dealing with Environment and coordination.

Multilateral Environmental Agreements:-

12. (1) The obligation of the International Conventions, Treaties and Protocols shall be observed as before devolution of the subject of Environment to the Province on Environment or climate change. In case of any international/ bilateral cooperation, the matter shall be proceeded with consultation with the concerned

Federal Ministries.

(2) The Government of Balochistan/ Environmental Protection Agency shall extend support to those obligation of the International Conventions, Treaties and Protocols where adequate assistance provided by the Federal Government.

Strategic Environment Assessment (SEA):-

13. (1) This section regulates the conditions, methods and procedure according to which the assessment of impAct of certain plans and programmes on the environment (hereinafter referred to as: strategic assessment) shall be carried out in order to provide for the environmental protection and improvement of sustainable development through integration of basic principles of environmental protection into the procedure of preparation and adoption of plans and programmes.

(2) The Government at all levels of administration and in every sector shall incorporate environmental considerations into policies, plans, programmes and strategies.

Prohibition of certain discharges or emissions and potential harmful items or materials .—

14. (1) Subject to the provisions of this Act and the rules and regulations no person shall discharge or emit or allow the discharge or emission of any effluent or waste or air pollutant or noise in an amount, concentration or level or is likely to cause, a significant adverse effect on the environment or human health which is in excess of the Environmental Quality Standards or, where applicable, the standards established under sub -clause (ii) of clause (f) of section 6.

(2) The Government of Balochistan shall not allow any imported or locally made commodities or items or materials or equipment or instruments or automobile or pesticides etc, into its provincial jurisdiction which may have any potential of causing Environmental problems.

(3) No person or company related to public and private sector shall introduce any of the imported or locally made items or materials or equipment or instruments or automobile or pesticides etc as per subsection (2) for any purpose unless it has filed an application to the Balochistan Environmental Protection Agency, as the case may be, and has obtained approval from the Government Agency in respect thereof.

(4) The Government of Balochistan may levy a pollution charge on any person who contravenes or fails to comply with the provisions of sub-section (1), to be calculated at such rate, and collected in accordance with such procedure as may be prescribed.

(5) Any person who pays the pollution charge levied under sub-section (2) shall not be charged with an offence with respect to that contravention or failure.

(6) The approved license in terms of section 15 of this Act does not affect the applicant's duty to obtain any other authorization required in order to undertake the Activity or implement the project concerned, whether in terms of this Act or any other legislation

(7) A person /firm causing discharge of pollutants shall take all reasonable measures to ensure that the best prActicable environmental option is adopted in relation to the discharge of emission and conservation of the environment.

Initial Environmental Examination and Environmental ImpAct Assessment.—

15. (1) No proponent of a project of public and private sector shall commence construction or operation unless he has filed an Initial Environmental Examination with the Government Agency designated by Balochistan Environmental Protection Agency, as the case may be, or, where the project is likely to cause an adverse

environmental effects an environmental impAct assessment, and has obtained from the Government Agency approval in respect thereof.

(2) The Government Agency shall subject to standards fixed by the Balochistan Environmental Protection Agency—

(a) review the initial environmental examination and accord its approval, or require submission of an environmental impAct assessme by the proponent; or

(b) review the environmental impAct assessment and accord its approval subject to such conditions as it may deem fit to impose, require that the environmental impAct assessment be re-submitted aft such modifications as may be stipulated or reject the project as being contrary to environmental objectives.

(3) Every review of an environmental impAct assessment shall be carried out with public participation and no information will be disclosed during the course of such public participation which relates to—

(i) trade, manufActuring or business Activities, processes or techniques of a proprietary nature, or financial, commercial, scientific or technical matters which the proponent has requested should remain confidential, unless for reasons to be recorded in writing, the Director General of the Balochistan Environmental Protection Agency is of the opinion that the request for confidentiality is not well- founded or the public interest in the disclosure outweighs the possible prejudice to the competitive position of the project or its proponent; or

(ii) international relations, national security or maintenance of law and order, except with the consent of the Government of Balochistan; or

(iii) matters covered by legal professional privilege.

(4) The Government Agency shall communicate its approval or otherwise within a period of four months from the date the initial environmental examination or environmental impAct assessment is filed complete in all respects in accordance with the prescribed procedure, failing which the initial environmental examination or, as the case may be, the environmental impAct assessment shall be deemed to have been approved, to the extent to which it does not contravene the provisions of this Act and the rules and regulations.

(5) Subject to sub-section (4) the appropriate Government may in a particular case extend the aforementioned period of four months if the nature of the project so warrants.

(6) The provisions of sub-sections (1), (2), (3), (4) and (5) shall apply to such categories of projects and in such manner as may be prescribed.

(7) The Government Agency shall maintain separate registers for initial environmental examination and environmental impAct assessment projects, which shall contain brief particulars of each project and a summary of decisions taken thereon, and which shall be open to inspection by the public at all reasonable hours and the disclosure of information in such registers shall be subject to the

restrictions specified in sub-section (3).

(8) No concession areas for any developmental Activities shall be awarded to any International/National groups or firms without consultation and concurrence of the Government of Balochistan/Environmental Protection Agency.

(9) The prospect licenses for mining, quarrying, crushing etc. shall only be awarded/ granted in compliance with the sub section (1), (2), (3), (4) and (5) .

(10) The cellular companies shall obtain environmental approval from the Balochistan EPA before installing Base Transceivers Station (BTS).

(11) BTS Stations should be required to undergo routine evaluation for Compliance. Whenever an application is submitted to the Balochistan EPA for construction or modification of a transmitting facility. EPA shall have the authority to take Action if a cellular base station antenna does not comply with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines and recommendations of the report titled `Environmental and Health Related Effects of the Cellular Base Station Antennas' carried out by IT and Telecom Division, Ministry of Information Technology.

(12) No person or company related to public and private sector shall commence construction or operation unless the concerned building authority accord approval under the provisions of the in vogue Building Code.

(13) after fulfilling the sub section (12) an Action plan shall be submitted to the concerned municipal/town/union council to carry out the Activities for a specific time period as to provide the general public or road users an alternative corridor.

(14) the waste generated during the construction or maintenance or repair of any building shall be appropriately disposed of or transported or collected to a designated place allocated for the purpose like any land fill site to avoid public nuisance.

(15) the construction or repair Activities especially in the main city area shall be carried out in a manner to minimize the road congestion or blockage.

(16) the proponent of the project shall remit fifty thousand rupees as review fee of an Initial Environmental Examination (IEE) and one hundred thousand as review fee for Environmental ImpAct Assessment (EIA).

(17) the person or company in public or private sector intend to commence any scheme or project do not falling under schedule I and II of this Act shall remit twenty five thousand rupees as an Environmental approval fee to the Balochistan Environmental Protection Agency.

Prohibition of import of hazardous waste.—

16. No person shall import hazardous waste into Balochistan and its jurisdiction limits.

Handling of hazardous substances and License:-

17. (1) Subject to the provisions of this Act, no person shall generate, collect, consign, transport, treat, dispose of, store, handle or import any hazardous substance except—

(a) under a license issued by the Government of Balochistan and in such manner as may be prescribed; or

(b) in accordance with the provisions of any other law for the time being in force, or of any international treaty, convention, protocol, code, standard, agreement or other instrument to which Pakistan is a party.

(2) Every owner or proponent of any land or premises on which hazardous waste is kept, treated or disposed of shall make a written application to the Balochistan Environmental Protection Agency for a hazardous waste management license, which shall at least include details of:

a) the chemical composition, nature and volume of the waste which is being, or will be, produced;

b) the industrial process, trade or Activity giving rise to the waste;

c) the way in which the applicant proposes to keep, treat or dispose of the hazardous waste, including storage and handling procedures;

d) the precautions which will be taken to avoid any adverse effects on the environment being caused by the hazardous waste.

(3). the Balochistan Environmental Protection Agency shall evaluate each application for a license under this Article in the following manner:

a) grant a hazardous waste management license, with or without conditions, if satisfied that the proposed method of keeping, treating and disposing of the hazardous waste will not cause any adverse effects; or

b) refuse to grant a license giving reasons for the refusal in writing to the applicant.

(4). the Balochistan Environmental Protection Agency would take a decision in regard to subsection 2 within thirty (30) days of the date of lodging of the application for a license.

(5) The license shall be granted for a reasonable period not exceeding five years. On expiry of the license for renewal same procedure shall be followed.

Electronic Wastes:-

18. (1) Every producer, distributer, collection centre, refurbisher, dismantler or recyclers shall store the electronic waste for a period not exceeding six months and shall maintain a record of collection, sale, transfer, storage and segregation of wastes and make these records available for inspection:

Provided that the Balochistan Environmental Protection Agency may extend the said period in following cases, namely:

(a) Dismantlers and Recyclers up to six months of their annual storage capacity of the owner; or

(b) Collection centers who do not have access to any registered dismantling or recycling facility; or

(c). the waste which needs to be specifically stored for development of a process for its recycling, reuse.

(2) Every producer, distributer, collection centre, refurbisher, dismantler or recyclers shall make arrangements for the environmentally sound management and disposal of electronic waste.

(3) the 'environmentally sound management of electronic waste' as "taking all steps required to ensure that electronic waste are managed in a manner which shall protect health and environment against any adverse effects, which may result from hazardous substance contained in such wastes."

(4) the provisions of this section shall apply to every producer, consumer and bulk consumer involved in manufActure, sale,

purchase and processing of electronic equipment or components.

(5) information dissemination on electronic waste and the environmentally sound management of electronic waste is also mandated from producers.

(6) to regulate the provisions of this section all the relevant international conventions, protocols and treaties collectively called as multilateral environmental agreements (MEAs) shall be applicable where Pakistan is signatory or ratified the MEAs.

(7) any person or company or unit who contravenes or fails to comply with the provisions of the above subsections shall be imposed penalty under section 25 of this Act.

General Prohibition in relation to Solid and Hospital Waste management and Waste Management License:-

19. (1) No person may collect, transport, sort, recover, store, dispose of or otherwise manage waste in a manner that results in a significant adverse effect.

(2) Every person who imports, produces, collects, recovers, transports, keeps, treats or disposes of waste shall take all reasonable measures to prevent a significant adverse effect on the environment from occurring.

(3) The owner or proponent of every premises upon which solid and hazardous hospital waste is produced shall ensure that all hazardous waste whether solid or hospital waste is separated from other waste, and is stored in separate containers pending disposal, in accordance with the requirements of the Balochistan Environmental Protection Agency as set out in regulations, published guidelines or license conditions.

(4) A person shall not dispose of solid and hazardous hospital waste in such a manner that it becomes litter or is likely to become litter.

(5) Unless in possession of a valid waste management license issued by the Balochistan Environmental Protection Agency, no person may construct, own or operate a landfill site, incinerator or other facility at which waste is permanently disposed of or is stored indefinitely.

(6). The Balochistan Environmental Protection Agency shall evaluate each application for a license and shall do the following:

a) grant a license if the Balochistan Environmental Protection Agency is satisfied that the applicant has sufficient expertise to undertake the Activity in question in accordance with the law and in a manner that will not have significant adverse effects; or

b) refuse to grant a license giving reasons for the refusal in writing to the applicant.

(7). The Balochistan Environmental Protection Agency shall reach a decision in regard to subsection 2 within thirty (30) days of the date of lodging of the application for a license with the Balochistan Environmental Protection Agency.

(8). If there are reasonable grounds to grant license, and those grounds are communicated to the license holder in writing, the Balochistan Environmental Protection Agency may amend, revoke or impose new conditions in an existing waste management license.

(9). The license granted under subsection (6) shall be subject to review if condition of license granted are not fulfilled.

Management of Water Resources:-

20. (1) All persons, for the purpose of protection, conservation, development, use, control and management of water resources, would take into account the following measures:

a) protecting aquatic and associated ecosystems and their biological diversity;

b) reducing and preventing pollution and degradation of water resources.

(2) When preparing water resource management plans, Departments and other relevant institutions shall at least take the following into account:

a) provisions for integrated watershed management;
b) regulation of sustainable abstrAction of groundwater;
c) regulation of the use of ground or surface water for agricultural, industrial, mining, and urban purposes;
d) measures to protect human health and ecosystems;
e) measures to protect wetlands and their associated ecosystems;
f) any other provision necessary for the sustainable use and management of water resources.

(3) An owner of land or a person who uses the land on which any Activity or process is performed or undertaken which causes or is likely to cause significant pollution of a water resource must take measures to prevent any such pollution.

Regulation of motor vehicles.

21. (1) Subject to the provisions of this Act, and the rules and regulations, no person shall operate a motor vehicle from which air pollutants or noise are being emitted in an amount, concentration or level which is in excess of the Environmental Quality Standards, or where applicable the standards established under clause (e) of section 6 (1).

(2) For ensuring compliance with the standards mentioned in sub-section (1), the Balochistan Environmental Protection Agency may direct that any motor vehicle or class of vehicles shall install such pollution control devices or other equipment or use such fuels or undergo such maintenance or testing as may be prescribed.

(3) Where a direction has been issued by the Government Agency under subsection (2) in respect of any motor vehicles or class of motor vehicles, no person shall operate any such vehicle till such direction has been complied with.

(4) To regulate the provision of this Act a green squad comprising of representative of Traffic Police, Motor Vehicle Examiner, Excise & Taxation and EPA Balochistan shall be in place to monitor and inspect the automobiles running on the road as per the Environment Quality Standard.

(5) The inspection or monitoring shall be carried out at least once in a month wherein a mechanism be chalked out for issuance of warning tickets (red: Highly polluted, Blue: less polluted) on a prominent on the vehicle, as the case may be for specific period of time not exceeding 30 days to maintain the vehicle in order .

(6) Whoever contravenes or fails to comply with the provision of subsection (5) such vehicle should be made off road or punishable with fine at least twenty thousand rupees which may be extended to one hundred thousand rupees. In the case of continuing contravention or failure the vehicle shall be impounded.

Alien Species and Living Modified Organisms:-

22. (1) The import into Balochistan of alien species and of living modified organisms is prohibited without a permit issued by the relevant authority under any law enforce in Balochistan. The Balochistan Environmental Protection Agency in consultation with the Departments of Agriculture, Livestock and Animal Husbandry and Food shall monitor the matter.

(2) No permit for the introduction of an alien species or of a living modified organism shall be issued unless the environmental impAct indicates that there is a reasonable certainty that no harm

proposed introduction.

(3) Subsection 1 and 2 of this Section shall apply equally to introductions of alien species and living modified organisms into the Province of Balochistan and to introductions from one ecosystem to another within the province.

(4) The introduction of alien species and living modified organisms into protected areas shall not be allowed.

Coastal Zone:-

23. (1) Subject to the provisions of this Act the Activities or concentration or level of discharges of the following units established on onshore and offshore shall be monitored strictly to prevent the pollution and environmental degradation caused by the following multi-magnitude and multidisciplinary units.

a) Ports and shipping
b) Fisheries
c) Ship dismantling
d) Shipping Traffic (Oil Tankers & Vessels) & dredging.
e) Oil and gas mineral exploration.
f) Coastal power plants and Energy sector.
g) Oil refineries and Industries

(2) The ship breaking at Gaddani or anywhere else in the coastal belt/zone of this province shall be subject to fulfilling all the relevant obligations under the Basel Convention "on the Control of Trans-boundary Movements of Hazardous Waste and their Disposal", Rotterdam Convention "on the prior Informed Consent(PIC) Procedure for certain Hazardous Chemicals and Pesticides in International Trade" and other relevant Treaties/Protocols and provisions of this Act.

(3) During the process of ship breaking/dismantling the waste, hazardous waste or sludge or Polychlorinated biphenyls or asbestos etc, shall be disposed of in a manner to ensure Protection of Terrestrial and Marine environment.

(4) The Activities of ship breaking/dismantling Activities on shore or offshore within territorial limit of Balochistan shall be monitored at least biannually to ensure environmental protection and prevent degradation and pollution.

(5) The disposal of untreated sewage and domestic wastes and untreated disposal of industrial effluents into the sea is an offence any person or company or unit who contravenes or fails to comply with the provisions of this Act shall face to penalty under section 25.

Environmental protection order.

24. (1) Where the Balochistan Environmental Protection Agency is satisfied that the discharge or emission of any effluent, waste, air pollutant or noise, or the disposal of waste, or the handling of hazardous substances, or any other Act or omission is likely to occur, or is occurring, or has occurred, in violation of the provisions of this Act, rules or regulations or of the conditions of a license, and is likely to cause, or is causing or has caused an adverse environmental effect, the Balochistan Environmental Protection Agency may, after giving the person responsible for such discharge, emission, disposal, handling, Act or omission an opportunity of being heard, by order direct such person to take such measures that the Balochistan Environmental Protection Agency may consider necessary within such period as may be specified in the order.

(2) In particular and without prejudice to the generality of the foregoing power, such measures may include—

(a) immediate stoppage, preventing, lessening or controlling the discharge, emission, disposal, handling, Act or omission, or to minimize or remedy the adverse environmental effect;

(b) installation, replacement or alteration of any equipment or thing to eliminate, control or abate on a permanent or temporary basis, such discharge, emission, disposal, handling, Act or omission;

(c) Action to remove or otherwise dispose of the effluent, waste, air pollutant, noise, or hazardous substances; and

(d) Action to restore the environment to the condition existing prior to such discharge, disposal, handling, Act or omission, or as close to such condition as may be reasonable in the circumstances, to the satisfAction of the Balochistan Environmental Protection Agency.

(3) Where the person, to whom directions under sub-section (1) are given, does not comply therewith, the Balochistan Environmental Protection Agency may, in addition to the proceedings initiated against him under this Act, the rules and regulations, itself take or cause to be taken such measures specified in the order as it may deem necessary and may recover the reasonable costs of taking such measures from such person as arrears of land revenue.

Penalties

25. (1) Whoever contravenes or fails to comply with the provisions of sections 14, 15, 16, 18 or section 24 or any order issued there-under shall be punishable with fine which may extend to one million rupees, and in the case of a continuing contravention or failure, with an additional fine which may extend to one hundred thousand rupees for every day during which such contravention or failure continues:

Provided that if contravention of the provisions of section 14 also constitutes contravention of the provisions of section 21, such contravention shall be punishable under sub-section (2) only.

(2) Whoever contravenes or fails to comply with the provisions of section 17, 19, 21, 22 or 23 or any rule or regulation or conditions of any license, any order or direction, issued by the Council or the Balochistan Environmental Protection Agency, shall be punishable with fine which may extend to one hundred thousand rupees, and in case of continuing contravention or failure with an additional fine which extend to one thousand rupees for every day during which such contravention continues.

(3) Where an accused has been convicted of an offence under sub-sections (1) and (2), the Environmental Court and Environmental Magistrate, as the case may be, shall, in passing sentence, take into account the extent and duration of the contravention or failure constituting the offence and the attendant circumstances.

(4) Where an accused has been convicted of an offence under sub-section (1) and the Environmental Court is satisfied that as a result of the commission of the offence monetary benefits have accrued to the offender, the Environmental Court may order the offender to pay, in addition to the fines under sub-section (1), further additional fine commensurate with the amount of the monetary benefits.

(5) Where a person convicted under sub-sections (1) or sub-section (2) had been previously convicted for any contravention under this Act, the Environmental Court or, as the case may be, Environmental Magistrate may, in addition to the punishment awarded thereunder—

(a) endorse a copy of the order of conviction to the concerned trade or industrial association, if any, or the concerned Provincial Chamber of Commerce and Industry or the Federation of Pakistan Chambers of Commerce and Industry;

(b) sentence him to imprisonment for a term which may extend to two years;

(c) order the closure of the fActory;

(d) order confiscation of the fActory, machinery, and equipment, vehicle, material or substance, record or document or other object used or involved in contravention of the provisions of the Act:

Provided that for a period of three years from the date of commencement of this Act the sentence of imprisonment shall be passed only in respect of persons who have been previously convicted for more than once for any contravention of sections 14, 16, 17, 18,19 or 24 involving hazardous waste;

(e) order such person to restore the environment at his own cost, to the conditions existing prior to such contravention or as close to such conditions as may be reasonable in the circumstances to the satisfAction of the Balochistan Environmental Protection Agency; and

(f) order that such sum be paid to any person as compensation for any loss, bodily injury, damage to his health or property suffered by such contravention.

(6) The Director-General of the Balochistan Environmental Protection Agency or an officer generally or specially authorized by him in this behalf may, on the application of the accused compound an offence under this Act with the permission of the Environmental Tribunals or Environmental Magistrate in accordance with such procedure as may be prescribed.

(7) Where the Director-General of the Balochistan Environmental Protection Agency is of the opinion that a person has contravened any provision of Act he may, subject to the rules, by notice in writing to that person require him to pay to the Balochistan Environmental Protection Agency an administrative penalty in the amount set out in the notice for each day the contravention continues; and a person who pays an administrative penalty for a contravention shall not be charged under this Act with an offence in respect of such contravention.

(8) The provisions of sub-sections (6) and (7) shall not apply to a person who has been previously convicted of offence or who has compounded an offence under this Act who has paid an administrative penalty for a contravention of any provision of this Act.

Offences by bodies corporate

26. Where any contravention of this Act has been committed by a body corporate, and it is proved that such offence has been

committed with the consent or connivance of, or is attributed to any negligence on the part of, any director, partner, manager, secretary or other Officer of the body corporate, such director, partner, manager, secretary or other officer of the body corporate, shall be deemed guilty of such contravention along with the body corporate and shall be punished accordingly:

Provided that in the case of a company as defined under the Companies Ordinance, 1984 (XLVII of 1984), only the Chief Executive as defined in the said Ordinance shall be liable under this section.

Explanation.— For the purposes of this section, "body corporate" includes a firm, association of persons and a society registered under the Societies Registration Act, 1860 (XXI of 1860), or under the Co-operative Societies Act, 1925 (VII of 1925).

Offences by Government Agencies, local authorities or local councils.

27. Where any contravention of this Act has been committed by any Government Agency, local authority or local council, and it is proved that such contravention has been committed with the consent or connivance of, or is attributable to any negligence on the part of, the Head or any other officer of the Government Agency, local authority or local council, such Head or other officer shall also be deemed guilty of such contravention along with the Government Agency, local authority or local council and shall be liable to be proceeded against and punished accordingly.

Balochistan Environmental Tribunals.—

28. (1) The Government of Balochistan may, by notification in the official gazette establish Balochistan Environmental Protection Tribunals which shall exercise jurisdiction under this Act.

(2) The Balochistan Environmental Protection Tribunal shall consist of a Chairperson who is, or has been, or is qualified for appointment as, a judge of the High Court to be appointed after consultation with the Chief Justice of the High Court and two members to be appointed by the Government of Balochistan which at least one shall be a technical member with suitable professional qualifications and experience; in the environmental field as may be prescribed. For every sitting of the Balochistan Environmental Protection Tribunal the presence of the Chairperson and not less than one Member shall be necessary.

(3) A decision of Balochistan Environmental Protection Tribunal shall be expressed in terms of the opinion of the majority or if the case has been decided by the Chairperson and only one of the members and a there is a difference of opinion between them, the ;decision of the Balochistan Environmental Protection Tribunal shall be expressed in terms of the opinion of the Chairperson.

(4) Balochistan Environmental Protection Tribunal shall not, merely by reason of a change in its composition, or the absence of any member from any sitting, be bound to recall and rehear any witness who has given evidence, and may Act on the evidence already ;recorded by, or produced, before it.

(5) Balochistan Environmental Protection Tribunal may hold its sittings at such places within its territorial jurisdiction as the Chairperson may decide.

(6) No Act or proceeding of Balochistan Environmental Protection Tribunal shall be invalid by reason only of the existence

of a vacancy in, or defect in the constitution, of, the Balochistan Environmental Protection Tribunal.

(7) The terms and conditions of service of the Chairperson and members of the Balochistan Environmental Protection Tribunal shall be such as may be prescribed.

Jurisdiction and powers of Balochistan Environmental Tribunals.

29. (1) Balochistan Environmental Protection Tribunal shall exercise such powers and perform such functions as are, or may be, conferred upon or assigned to it by or under this Act or the rules and regulations made there under.

(2) All contravention punishable under sub-section (1) of section 25 shall exclusively be triable by Balochistan Environmental Protection Tribunal.

(3) Balochistan Environmental Protection Tribunal shall not take cognizance of any offence triable under sub-section (2) except on a complaint in writing by- -

(a) the Government Agency or local council; and

(b) any aggrieved person, who has given notice of not less than thirty days to the Provincial Agency concerned, of the alleged contravention and of his intention to make a complaint to the Environment Tribunal.

(4) In exercise of its criminal jurisdiction, the Balochistan Environmental Protection Tribunal shall have the same powers as are vested in Court of Session under the Code of Criminal Procedure, 1898 (Act V of 1898).

(5) In exercise of the appellate jurisdiction under section 22 the Balochistan Environmental Protection Tribunal shall have the same powers and shall follow the same procedure as an appellate court in the Code of Civil Procedure, 1908 (Act V of 1908).

(6) In all matters with respect to which no procedure has been provided for in this Act, the Balochistan Environmental Protection Tribunal shall follow the procedure laid down in the Code of Civil Procedure, 1908 (Act V of 1908).

(7) Balochistan Environmental Protection Tribunal may, on application filed by any officer duly authorized in this behalf by the Director-General of the Balochistan Environmental Protection Agency, issue bail able warrant for the arrest of any person against whom reasonable suspicion exist, of his having been involved in contravention punishable under sub-section (1) of Section 25:

Provided that such warrant shall be applied for, issued, and executed in accordance with the provisions of the Code of Criminal Procedure, 1898 (Act V of 1898):

Provided further that if the person arrested executes a bond with sufficient sureties in accordance with the endorsement on the warrant he shall be released from custody, failing which he shall be taken or sent without delay to the officer in-charge of the nearest police station.

(8) All proceedings before the Balochistan Environmental

Protection Tribunal shall be deemed to be judicial proceedings within the meaning of section 193 and 228 of the Pakistan Penal Code (Act XLV of 1860), and the Balochistan Environmental Protection Tribunal shall be deemed to be a court for the purpose of section 480 and 482 of the Code of Criminal Procedure, 1898 (Act V of 1898).

(9) No court other than Balochistan Environmental Protection Tribunal shall have or exercise any jurisdiction with respect to any matter to which the jurisdiction of Balochistan Environmental Protection Tribunal extends under this Act, the rules and regulations made thereunder.

(10) Where the Balochistan Environmental Protection Tribunal is satisfied that a complaint made to it under sub-section (3) is false and vexatious to the knowledge of the complainant, it may, by an order, direct the complainant to pay to the person complained against such compensatory costs which may extend to five hundred thousand rupees.

Appeals to the Environmental Tribunal.—

30. (1) Any person aggrieved by any order or direction of the Balochistan Environmental Protection Agency under any provision of this Act, and rules or regulations may prefer an appeal with the Balochistan Environmental Protection Tribunal within thirty days of the date of communication of the impugned order or direction to such person.

(2) An appeal to the Balochistan Environmental Protection Tribunal shall be in such form, contain such particulars and be accompanied by such fees as may be prescribed.

Appeals from orders of the Environmental Tribunal

31. (1) Any person aggrieved by any final order or by any sentence of the Balochistan Environmental Protection Tribunal passed under this Act may, within thirty days of communication of such order or sentence, prefer an appeal to the High Court.

(2) An appeal under sub-section (I) shall be heard by a Bench of not less than two Judges.

Jurisdiction of Environmental Magistrates.

32. (1) Notwithstanding anything contained in the Code of Criminal Procedure, 1898 (Act V of 1898), or any other law for the time being in force, but subject to the provisions of this Act, all contravention punishable under sub-section (2) of section 25 shall exclusively be trial-able by Environmental Magistrate especially empowered in this behalf under section 14 of the Code of Criminal Procedure, 185(Act No. V of 1898).

(2) An Environmental Magistrate shall be competent to impose any punishment specified in sub-sections (2) and (4) of section 25.

(3) An Environmental Magistrate shall not take cognizance of an offence trial able under sub-section (I) except on a complaint in writing by—

(a) the Balochistan Environmental Protection Agency, or Government Agency or a local council; and

(b) any aggrieved person.

Appeals from orders of Environmental Magistrates.

33. Any person convicted of any contravention of this Act or the rules or regulations by an Environmental Magistrate may, within thirty days from the date of his conviction, appeal to the Court of Sessions whose decision thereon shall be final.

Power to delegate.

34. *(1)* The Government of Balochistan may, by notification in the official Gazette, delegate any of its or of the Balochistan Environmental Protection Agency powers and functions under this Act and the rules and regulations to any Government Agency, local council or local authority.

(2) The Balochistan Environmental Protection Agency may also by notification in the official Gazette, delegate any of its powers or functions under this Act and the rules and regulations to EPA Regional or sub-offices. In case of nonexistence of its Regional/Sub-offices may delegate its powers or functions to any local council or local authority in the Province.

Power to give directions.

35. In the performance of its functions the Provincial Agency shall be bound by the direction given to it in writing by the Government.

Indemnity.

36. No suit, prosecution or other legal proceedings shall lie against the Government , the Council, the Balochistan Environmental Protection Agency, the Director-Generals of the Balochistan Environmental Protection Agency, members, officers, employees, experts, advisers, committees or consultants of the Balochistan Environmental Protection Agency or the Environmental Tribunal or Environmental Magistrates or any other person for anything which is in good faith done or intended to be done under this Act or the rules or regulations made thereunder.

Dues recoverable as arrears of land revenue.

37. Any dues recoverable by the Balochistan Environmental Protection Agency under this Act, or the rules or regulations shall be recoverable as arrears of land revenue.

Act to override other laws.

38. The provisions of this Act shall have effect notwithstanding anything inconsistent therewith contained in any other law for the time being in force.

Power to make rules.

39. The Government of Balochistan may, by notification in the official Gazette, make rules for carrying out the purposes of this Act including rules for implementing the provisions of the international environmental Agreements, specified in the Schedule to this Act.

Power to amend the Schedule

40. The Government of Balochistan may, by notification in the official Gazette, amend the Schedule so as to add any entry thereato or modify or omit any entry therein.

Power to make regulations.

41. (1) For carrying out the purposes of this Act, the Balochistan Environmental Protection Agency may, by notification in the official Gazette and with the approval of the Government of Balochistan, make regulations not inconsistent with the provisions of this Act or the rules made thereunder.

(2) In particular and without prejudice to the generality of the foregoing power, such regulations may provide for

(a) submission of periodical reports, data or information by any Government agency, local authority or local council in respect

of environmental matters;

(b) preparation of emergency contingency plans for coping with environmental hazards and pollution caused by accidents, natural disasters and calamities;

(c) appointment of officers, advisers, experts, consultants and employees;

(d) levy of fees, rates and charges in respect of services rendered, Actions taken and schemes implemented;

(e) monitoring and measurement of discharges and emissions;

(f) categorization of projects to which, and the manner in which, section 15 applies;

(g) laying down of guidelines for preparation of initial environmental examination and environmental impAct assessment and Development of procedures for their filing, review and approval;

(h) providing procedures for handling hazardous substances; and

(i) installation of devices in, use of fuels by, and maintenance and testing of motor vehicles for control of air and noise pollution.

Repeal, savings and succession.

42. (1) The provision of Pakistan Environmental Protection Act 1997 (Act No.XXXIV of 1997) applicable to the Province of Balochistan are hereby repealed.

(2) Notwithstanding the repeal of the Pakistan Environmental Protection Act 1997 hereinafter called the repealed Act, any rules or regulations or appointments made, orders passed, notifications issued, powers delegated, contrActs entered into, proceedings commenced, rights acquired liabilities incurred, penalties, rates, fees or charges levied, things done or Action taken under any provisions of the repealed Act shall, so far as they are not inconsistent with the provisions of this Act be deemed to have been made, passed, issued, delegated, entered into, commenced, acquired, incurred, levied, done or taken under this Act, until they are repealed, rescind, withdrawn, cancelled, replaced or modified in accordance with the provisions of this Act.

(3) On the establishment of the Balochistan Environmental Protection Agency under this Act, all properties, assets and liabilities pertaining to the Balochistan Environmental Protection Agency established under repealed Act shall vest in and be the properties, assets and liabilities, as the case may be, of the Balochistan Environmental Protection Agency established under this Act.

(4) The Balochistan Environmental Protection Agency constituted under the repealed Act and existing immediately before the commencement of this Act shall be deemed to have been constituted under section 5 and the Director General and other officers and employees appointed in the said Agency shall be deemed to be Director General, officers and employees appointed under the Balochistan Civil Servant Act 1974.

(5) Notwithstanding the repeal of the Pakistan Environmental Protection Act 1997(Act No.XXXIV of 1997), all proceeding pending immediately before commencement of this Act, against any person under the repealed Act and rules, regulation or order made thereunder, or any other Law or rules shall continue under that Law and rules, in the manner proceeded thereunder.

SCHEDULE
(See section 39)

1. International Plant Protection Convention, Rome, 1951.

2. Plant Protection Agreement for the South-East Asia and Pacific Region (as amended), Rome, 1956.

3. Agreement for the Establishment of a Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia (as amended), Rome, 1963.

4. Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Ramsar, 1971 and its amending Protocol, Paris, 1982.

5. London Convention on Ocean Dumping 1972.

6. Convention Concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention), 1972.

7. MARPOL Convention on Prevention of Pollution from Ship, 1973/78

8. Convention on International Trade in Endangered Species of Wild Funa and Flora (CITES), Washington, 1973.

9. Convention on the Conservation of Migratory Species of Wild Animals, Bonn, 1979.

10. Convention on the Law of the Sea, Montego Bay, 1982.

11. Vienna Convention for the Protection of the Ozone Layer, Vienna, 1985.

12. Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1987 and amendments thereto.

13. Agreement on the Network of Agriculture Centres in Asia and the Pacific, Bangkok, 1988.

14. Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal, Basel, 1989.

15. Convention on Biological Diversity, Rio de Janeiro, 1992.

16. United Nations Framework Convention on Climate Change, Rio De Janeiro, 1992.

17. Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 17 March 1992.

18. The Rio Declaration on Environment and Development, 13 June 1992

19. London Amendment to Montreal Protocol on Substances that deplete the ozone layer, 10 Aug 1992

20. United Nations Convention on the Law of the Sea, 16 Nov 1994

21. Washington Declaration on Land Based Marine Pollution 1995.

22. UN Convention on Non-Navigational Uses of International Watercourses, 1995

23. Ban Amendment to the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 22 Sept 1995.

24. The Kyoto Protocol, 11 Dec 1997

25. The Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 11 Sept 1998.

26. The Beijing Amendment to the Montreal Protocol on Substances that deplete the ozone layer, 1 Jan 2000

27. The Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 29 Jan 2000.

28. Stockholm Convention on Persistent Organic Pollutants (POPs), 23 May 2001.

29. International Treaty on Plant Genetic Resources for Food and Agriculture, 3 Nov 2001.

30. Hong Kong International Convention For The Safe And Environmentally Sound Recycling Of Ships, 2009

SECRETARY

Balochistan Provincial Assembly

NO EVEN DATED EVEN.

A copy is forwarded to the Controller, Government Printing, Press, Balochistan, Quetta for favour of publication in an extra-ordinary issue of Gazette of Balochistan dated 15th January, 2013.

1. To make sure proop-reading by this Secretariat before final printing.
2. Fifty copies of the Act may please be supplied to this Secretariat.

(SHAMS UDDIN)
Additional Secretary (Legis :)
Balochistan Provincial Assembly

NO. EVEN DATED EVEN.

A copy is forwarded for information to the:-

1. Secretary, Government of Balochistan, Environment Department, Quetta.
2. Secretary, Law Department, Government of Balochistan, Quetta.
3. Director Public Relation, Quetta for publication in public interest.

Additional Secretary (Legis :)

Annexure III

Pakistan EIA/IEE Regulations,2000

REGISTERED No. M-302
L-7646

THE GAZETTE OF PAKISTAN

EXTRAORDINARY
PUBLISHED BY AUTHORITY

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ISLAMABAD, THURSDAY, JUNE 15, 2000

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PART II

Statutory Notifications (S. R. O.)

GOVERNMENT OF PAKISTAN

MINISTRY OF ENVIRONMENT
LOCAL GOVERNMENT AND RURAL DEVELOPMENT

NOTIFICATION

Islamabad, the 13th June, 2000

S.R.O. 339 (I)/2000. - In exercise of the powers referred by section 33 of the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the approval of the Federal Government, is pleased to make the following regulations, namely : -

1. Short title and commencement.-

(1) These regulations may be called the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000.

(2) They shall come into force at once.

2. Definitions.-

(1) In these regulations, unless there is anything repugnant in the subject or context ,–

(a) “Act” means the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997);

(b) “Director-General” means the Director-General of the Federal Agency;

(c) “EIA” means an environmental impact assessment as defined in clause (xi) section 2 of the Act, 1997;

(d) “IEE” means an initial environmental examination as defined in clause (xxiv) section 2 of the Act, 1997;

(e) “Schedule” means a schedule to these regulations; and

(f) “section” means a section of the Act, 1997.

(2) All other words and expressions used in these regulations but not defined herein shall have the same meanings as are assigned to them in the Act.

3. Projects requiring an IEE

A proponent of a project falling in any category specified in Schedule I shall file an IEE with the Federal Agency, and the provisions of section 12 shall apply to such project.

4. Projects requiring an EIA

A proponent of a project falling in any category specified in Schedule II shall file an EIA with the Federal Agency, and the provisions of section 12 of the Act shall apply to such project.

5. Other projects requiring an IEE or EIA

(1) In addition to any category specified in Schedules I and II, a proponent of any of the following projects shall file,-

(a) an EIA, if the project is likely to cause an adverse environmental effect;

(b) for projects not listed in Schedules I and II but in respect of which the Federal Agency has issued guidelines for construction and operation, an application for approval accompanied by an undertaking and an affidavit that the aforesaid guidelines shall be fully complied with.

(2) Subject to regulation 3, the Federal Agency may direct the proponent of a project, whether or not listed in Schedule I or II, to file an IEE or EIA, for reasons to be recorded in such direction:

(3) No direction under sub-regulation (2) shall be issued without the recommendation, in writing, of the Environmental Assessment Advisory Committee constituted under Regulation 23.

(4) The provisions of section 12 shall apply to a project in respect of which an IEE or EIA is filed under sub-regulation (1) or (2).

6. Preparation of IEE and EIA.-

(1) The Federal Agency may issue guidelines for preparation of an IEE or an EIA, including guidelines of general applicability and sectoral guidelines indicating specific assessment requirements for planning, construction and operation of projects relating to a particular sector.

(2) Where guidelines have been issued under sub-regulation (1), an IEE or EIA shall be prepared, to the extent practicable, in accordance therewith and the proponent shall justify in the IEE or, as the case may be, EIA any departure therefrom.

7. Review of fees.-

The proponent shall pay, at the time of submission of an IEE or EIA, a nonrefundable Review Fee to the Federal Agency, in accordance with rates specified in Schedule III.

8. Filing of IEE and EIA.-

(1) Ten paper copies and two electronic copies of an IEE or EIA shall be filed with the Federal Agency.

(2) Every IEE and EIA shall be accompanied by –

(a) an application, in the form set out in Schedule IV; and

(b) copy of receipt showing payment of the Review Fee.

9. Preliminary scrutiny.-

(1) Within ten working days of filing of the IEE or EIA, the Federal Agency shall, -

(a) confirm that the IEE or EIA is complete for purposes of initiation of the review process;

(b) require the proponent to submit such additional information as may be specified; or

(c) return the IEE or EIA to the proponent for revision, clearly listing the points requiring further study and discussion.

(2) Notwithstanding anything contained in sub-regulation (1) the Federal Agency may require the proponent to submit additional information at any stage during the review process.

10. Public participation. -

(1) In the case of an EIA, the Federal Agency shall, simultaneously with issue of confirmation of completeness under clause (a) of sub-regulation (1) of Regulation 9, cause to be published, in any English or Urdu national newspaper, a public notice mentioning therein the type of project, its exact location, the name and address of the proponent and the places at which the EIA of the project can, subject to the restrictions in sub-section (3) of section 12, be accessed.

(2) The notice issued under sub-regulation (1) shall fix a date, time and place for public hearing of any comments on the project or its EIA.

(3) The date fixed under sub-regulation (2) shall not be earlier than thirty days from the date of publication of the notice.

(4) The Federal Agency shall also ensure the circulation of the EIA to the concerned Government Agencies and solicit their comments thereon.

(5) All comments received by the Federal Agency from the public or any concerned Government Agency shall be collated, tabulated and duly considered by it before its decision on the EIA.

(6) The Federal Agency may issue guidelines indicating the basic techniques and measures to be adopted to ensure effective public consultation, involvement and participation in EIA assessment.

11. Review.-

(1) The Federal Agency shall make every effort to carry out its review of the IEE within forty five days, and of the EIA within ninety days, of issue of confirmation of completeness under clause (a) of sub-regulation (1) of regulation 9.

(2) In reviewing the IEE or EIA, the Federal Agency shall consult such Committee of Experts as may be constituted for the purpose by the Director-General, and may also solicit views of the concerned Advisory Committee, if any, constituted by the Federal Government under subsection (6) of section 5.

(3) The Director-General may, where he considers it necessary, constitute a committee to inspect the site of the project and submit its report on such matters as may be specified by him.

(4) The review of the IEE or EIA by the Federal Agency shall be based on quantitative and qualitative assessment of the documents and data furnished by the proponent, comments from the public and concerned Government Agencies received under regulation 10, and views of the committees mentioned in sub-regulations (2) and (3).

12. Decision. -

On completion of the review, the decision of the Federal Agency shall be communicated to the proponent in the form set out in Schedule V in the case of an IEE, and in the form set out in Schedule VI in the case of an EIA.

13. Conditions of approval. -

(1) Every approval of an IEE or EIA shall, in addition to such conditions as may be imposed by the Federal Agency, be subject to the condition that the project shall be designed and constructed, and mitigatory and other measures adopted, strictly in accordance with the IEE or, as the case may be, EIA, unless any variation thereto have been specified in the approval by the Federal Agency.

(2) Where the Federal Agency accords its approval subject to certain conditions, the proponent shall –

(a) before commencing construction of the project, acknowledge acceptance of the stipulated conditions by executing an undertaking in the form set out in Schedule VII; and

(b) before commencing operation of the project, obtain from the Federal Agency a written confirmation of compliance that the conditions of the approval, and the requirements given in the IEE or EIA relating to design and construction, adoption of mitigatory and other measures and other relevant matters, have been duly complied with.

14. Confirmation of compliance. -

(1) The request for obtaining a written confirmation of compliance under clause (b) of sub-regulation (2) of Regulation 13 shall be accompanied by an Environmental Management Plan indicating the measures and procedures proposed to be taken to manage or mitigate the environmental impacts for the life of the project, including provisions for monitoring, reporting and auditing.

(2) Where a request for confirmation of compliance is received from a proponent, the Federal Agency may carry out such inspection of the site and plant and machinery and seek such additional information from the proponent as it may deem fit.

(3) The Federal Agency shall issue the written confirmation of compliance or otherwise within fifteen days of receipt of the request and such additional information, from the proponent as may be required under sub-regulation (2).

(4) The Federal Agency may, while issuing the written confirmation of compliance, impose such other conditions as to the Environmental Management Plan, and the operation, maintenance and monitoring of the project as it may deem fit, and such conditions shall be deemed to be included in the conditions to which approval of the project is subject.

15. Extension in review period

Where the Federal Government in any particular case extends the period of four months for communication of its approval under sub-section (5) of section 12, it shall, in consultation with the Federal Agency, indicate the various steps of the review process to be taken during the extended period, and the estimated time required for each step.

16. Validity period of approval, -

(1) The approval accorded by the Federal Agency under section 12 read with regulation 12 shall be valid for commencement of construction for a period of three years from the date of issue.

(2) If construction is commenced during the initial three years validity period, the validity of the approval shall stand extended for a further period of three years from the expiry of period specified in sub-regulation (1).

(3) After issue of confirmation of compliance, the approval shall be valid for a period of three years from the date thereof.

(4) Subject to sub-regulation (5), the proponent may apply to the Federal Agency for extension in the validity periods mentioned in sub-regulations (1), (2) and (3), which may be granted by the Federal Agency in its discretion for such period not exceeding three years at a time, if the conditions of the approval do not require significant change.

(5) For the purposes of sub-regulation (4), the Federal Agency may require the proponent to submit a fresh IEE or, as the case may be, EIA, if in its opinion changes in location, design, construction and operation of the project so warrant.

17. Entry and inspection, -

(1) For purposes of verification of any matter relating to the review or to the conditions of approval of an IEE or EIA prior to, during or after the commencement of construction or operation of a project, duly authorized staff of the Federal Agency may enter and inspect the project site, factory building and plant and equipment installed therein.

(2) The proponent shall take steps to ensure full cooperation of the project staff at site to facilitate the inspection, and shall provide such information as may be required by the Federal Agency for the purpose of such inspection and pursuant thereto.

18. Monitoring, -

(1) After issue of an approval, the proponent shall submit a report to the Federal Agency after completion of construction of the project.

(2) After issue of confirmation of compliance, the proponent shall submit an annual report summarizing operational performance of the project, with reference to the conditions of the approval and maintenance and mitigatory measures adopted for the project.

19. Cancellation of approval, -

(1) In case, at any time, on the basis of information or report received or inspection carried out, the Federal Agency is of the opinion that the conditions of an approval have not been complied with, or that the information supplied by a proponent in the approved IEE or EIA is incorrect, it shall issue notice to the proponent to show cause, within two weeks of receipt thereof as to why the approval should not be cancelled.

(2) If no reply is received, or the reply is considered unsatisfactory, the Federal Agency may, after giving the proponent an opportunity of being heard, -

(a) require the proponent to take such measures and to comply with such conditions within such period as it may specify, failing which the approval shall stand cancelled; or

(b) cancel the approval.

(3) On cancellation of the approval, the proponent shall cease construction or operation of the project forthwith.

(4) Action taken under this regulation shall be without prejudice to any other action that may be taken against the proponent under the Act, rules, regulations or any other law for the time being in force.

20. Registers of IEE and EIA projects, -

Separate Registers shall be maintained by the Federal Agency for IEE and EIA projects under sub-section (7) of section 12 in the form set out in Schedule VIII.

21. Environmentally sensitive areas, -

(1) The Federal Agency may, by notification in the official Gazette, designate an area to be an environmentally sensitive area.

(2) Notwithstanding anything contained in regulations 3 and 4, the proponent of a project situated in an environmentally sensitive area shall be required to file an EIA with the Federal Agency.

(3) The Federal Agency may, from time to time, issue guidelines to assist proponents and other persons involved in the environmental assessment process to plan and prepare projects located in environmentally sensitive areas.

(4) Where guidelines have been issued under sub-regulation (3), the projects shall be planned and prepared, to the extent practicable, in accordance therewith and any departure therefrom justified in the EIA pertaining to the project.

22. Environmental Assessment Advisory Committee, -

For the purposes of rendering advice on all aspects of environmental assessment, including guidelines, procedures and categorization of projects, the Director-General shall constitute an Environmental Assessment Advisory Committee consisting of the following persons namely:-

(a)	Director EIA, Federal Agency	…	*Chairman*
(b)	One representative each of the Provincial Agencies	…	*Members*
(c)	One representative each of the Federal Planning Commission and the Provincial Planning and Development Departments	…	*Members*
(d)	Four Representatives one each of industry, non-Governmental organizations, legal and other experts	…	*Members*

23. Other approvals

Issue of an approval under section 12 read with regulation 12 shall not absolve the proponent of the duty to obtain any other approval or consent that may be required under any law for the time being in force.

SCHEDULE I

(*See* Regulation 3)

List of projects requiring an IEE

A. Agriculture, Livestock and Fisheries, etc.

1. Poultry, livestock, stud and fish farms with total cost of more than ten million rupees.
2. Projects involving repacking, formulation or warehousing of agricultural produce.

B. Energy

1. Hydroelectric power generation less than 50 MW.
2. Thermal power generation less than 200 MW.
3. Transmission lines less than 11 KV, and large distribution projects.
4. Oil and gas transmission systems.
5. Oil and gas extraction projects including exploration, production, gathering systems, separation and storage
6. Waste-to-energy generation projects.

C. Manufacturing and processing

1. Ceramics and glass units with total cost of more than fifty million rupees.
2. Food processing industries including sugar mills, beverages, milk and dairy products, with total cost less than one hundred million rupees.
3. Man-made fibers and resin projects with total cost of less than one hundred million rupees.
4. Manufacturing of apparel, including dyeing and printing, with total cost of more than twenty five million rupees.
5. Wood products with total cost of more than twenty five million rupees.

D. Mining and mineral processing

1. Commercial extraction of sand, gravel, limestone, clay, sulphur and other minerals not included in Schedule II with total cost of less than one hundred million rupees.
2. Crushing, grinding and separation processes.
3. Smelting plants with total cost of less than fifty million rupees.

E. Transport

1. Federal or Provincial highways (except maintenance, rebuilding or reconstruction of existing metalled roads) with total cost of less than fifty million rupees.

2. Ports and harbor development for ships less than five hundred gross tons.

F. Water management, dams, irrigation and flood protection

1. Dams and reservoirs with storage volume less than fifty million cubic meters or surface area less than eight square kilometers.

2. Irrigation and drainage projects serving less than fifteen thousand hectares.

3. Small-scale irrigation systems with total cost less than fifty million rupees.

G. Water supply and treatment

Water supply schemes and treatment plants with total cost less than twenty-five million rupees.

H. Waste disposal

Waste disposal facility for domestic or industrial wastes, with annual capacity less than ten thousand cubic meters

I. Urban development and tourism

1. Housing schemes.

2. Public facilities with significant off-site impacts e.g. hospital wastes.

3. Urban development projects

J. Other Projects

Any other project for which filing of an IEE is required by the Federal Agency under sub-regulation (2) of regulation 5.

SCHEDULE II

(*See* Regulation 4)

List of projects requiring an EIA

A. Energy

1. Hydroelectric power generation over fifty megawatts.
2. Thermal power generation over two hundred megawatts.
3. Transmission lines (eleven kilovots and above) and grid stations.
4. Nuclear power plants.
5. Petroleum refineries.

B. Manufacturing and processing

1. Cement plants.
2. Chemicals projects.
3. Fertilizer plants.
4. Food processing industries including sugar mills, beverages, milk and dairy products, with total cost of one hundred million rupees and above.
5. Industrial estates (including export processing zones).
6. Man-made fibers and resin projects with total cost of one hundred million rupees and above.
7. Pesticides (manufacture or formulations).
8. Petrochemicals complex.
9. Synthetic resins, plastics and man-made fibers, paper and paperboard, paper pulping, plastic products, textiles (except apparel), printing and publishing, paints and dyes, oils and fats and vegetable ghee projects, with total cost more than ten million rupees.
10. Tanning and leather finishing projects

C. Mining and mineral processing

1. Mining and processing of coal, gold, copper, sulphur and precious stones.
2. Mining and processing of major non-ferrous metals, iron and steel rolling.
3. Smelting plants with total cost of fifty million rupees and above

D. Transport

1. Airports

2. Federal or Provincial highways or major roads (except maintenance, rebuilding or reconstruction of existing roads) with total cost of fifty million rupees and above.

3. Ports and harbor development for ships of five hundred gross tons and above.

4. Railway works.

E. Water management, dams, irrigation and flood protection

1. Dams and reservoirs with storage volume of fifty million cubic meters and above or surface area of eight square kilometers and above.

2. Irrigation and drainage projects serving fifteen thousand hectares and above.

F. Water supply and treatment

Water supply schemes and treatment plants with total cost of twenty-five million rupees and above.

G. Waste Disposal

1. Waste disposal and storage of hazardous or toxic wastes including landfill sites and incineration of hospital toxic waste.

2. Waste disposal facilities for domestic or industrial wastes, with annual capacity more than ten thousand cubic meters.

H. Urban development and tourism

1. Land use studies and urban plans in large cities.

2. Large-scale tourism development projects with total cost more than fifty million rupees.

I. Environmentally Sensitive Areas

All projects situated in environmentally sensitive areas

J. Other projects

1. Any other project for which filing of an EIA is required by the Federal Agency under sub-regulation (2) of regulation 5.

2. Any other project likely to cause an adverse environmental effect.

Annexure IV

National Environmental Quality Standards (NEQS)

REGISTERED No. M - 302
L.-7646

The Gazette of Pakistan

EXTRAORDINARY
PUBLISHED BY AUTHORITY

ISLAMABAD, FRIDAY, NOVEMBER 26, 2010

PART II

Statutory Notifications (S. R. O.)

GOVERNMENT OF PAKISTAN

MINISTRY OF ENVIRONMENT

NOTIFICATIONS

Islamabad, the 18th October, 2010

S. R. O. 1062(I)/2010.—In exercise of the powers conferred under clause (c) of sub-section (I) of section 6 of the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the prior approval of the Pakistan Environmental Protection Council, is pleased to establish the following National Environmental Quality Standards for Ambient Air.

National Environmental Quality Standards for Ambient Air

Pollutants	Time-weighted average	Concentration in Ambient Air		Method of measurement
		Effective from 1st July, 2010	Effective from 1st January 2013	
Sulphur Dioxide (SO_2)	Annual Average* 24 hours**	80 $\mu g/m^3$ 120 $\mu g/m^3$	80 $\mu g/m^3$ 120 $\mu g/m^3$	-Ultraviolet Fluorescence method
Oxides of Nitrogen as (NO)	Annual Average* 24 hours**	40 $\mu g/m^3$ 40 $\mu g/m^3$	40 $\mu g/m^3$ 40 $\mu g/m^3$	- Gas Phase Chemiluminescence

[2944(2010)/Ex. Gaz.] *Price: Rs. 5.00*

Pollutants	Time-weighted average	Concentration in Ambient Air: Effective from Ist July, 2010	Concentration in Ambient Air: Effective from Ist January 2013	Method of measurement
Oxides of Nitrogen as (NO_2)	Annual Average*	40 $\mu g/m^3$	40 $\mu g/m^3$	- Gas Phase Chemiluminescence
	24 hours**	80 $\mu g/m^3$	80 $\mu g/m^3$	
O^3	1 hour	180 $\mu g/m^3$	130 $\mu g/m^3$	-Non dispersive UV absorption method
Suspended Particulate Matter (SPM)	Annual Average*	400 $\mu g/m^3$	360 $\mu g/m^3$	- High Volume Sampling, (Average flow rate not less than 1.1 m3/minute).
	24 hours**	550 $\mu g/m^3$	500 $\mu g/m^3$	
Respirable Particulate Matter. PM_{10}	Annual Average*	200 $\mu g/m^3$	120 $\mu g/m^3$	-β Ray absorption method
	24 hours**	250 $\mu g/m^3$	150 $\mu g/m^3$	
Respirable Particulate Matter. $PM_{2.5}$	Annual Average*	25 $\mu g/m^3$	15 $\mu g/m^3$	-β Ray absorption method
	24 hours**	40 $\mu g/m^3$	35 $\mu g/m^3$	
	1 hour	25 $\mu g/m^3$	15 $\mu g/m^3$	
Lead Pb	Annual Average*	1.5 $\mu g/m^3$	1 $\mu g/m^3$	- ASS Method after sampling using EPM 2000 or equivalent Filter paper
	24 hours**	2 $\mu g/m^3$	1.5 $\mu g/m^3$	
Carbon Monoxide (CO)	8 hours**	5 mg/m^3	5 mg/m^3	- Non Dispersive Infra Red (NDIR) method
	1 hour	10 mg/m^3	10 mg/m^3	

*Annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

** 24 hourly /8 hourly values should be met 98% of the in a year. 2% of the time. it may exceed but not on two consecutive days.

S. R. O. 1063(I)/2010.— In exercise of the powers conferred under clause (c) of sub-section (1) of section 6 of the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the prior approval of the Pakistan Environmental Protection Council, is pleased to establish the following National Standards for Drinking Water Quality.

National Standards for Drinking Water Quality

Properties/Parameters	Standard Values for Pakistan	Who Standards	Remarks
Bacterial			
All water intended for drinking (e.Coli or Thermotolerant Coliform bacteria)	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Most Asian countries also follow WHO standards
Treated water entering the distribution system (E.Coli or thermo tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Most Asian countries also follow WHO standards
Treated water in the distribution system (E. coli or thermo tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample In case of large supplies, where sufficient samples are examined, must not be present in 95% of the samples taken throughout any 12-month period.	Must not be detectable in any 100 ml sample In case of large supplies, where sufficient samples are examined, must not be present in 95% of the samples taken throughout any 12 month period.	Most Asian countries also follow WHO standards
Physical			
Colour	≤ 15 TCU	≤ 15 TCU	
Taste	Non objectionable/Acceptable	Non objectionable/Acceptable	
Odour	Non objectionable/Acceptable	Non objectionable/Acceptable	
Turbidity	〈 5 NTU	〈 5 NTU	
Total hardness as $CaCO_3$	< 500 mg/l	----	
TDS	〈 1000	〈 1000	
pH	6.5 – 8.5	6.5 – 8.5	
Chemical			
Essential Inorganic	***mg/Litre***	***mg/Litre***	
Aluminium (Al) mg/l	≤ 0.2	0.2	

Properties/Parameters	Standard Values for Pakistan	Who Standards	Remarks
Antimony (Sb)	≤ 0.005 (P)	0.02	
Arsenic (As)	≤ 0.05 (P)	0.01	Standard for Pakistan similar to most Asian developing countries
Barium (Ba)	0.7	0.7	
Boron (B)	0.3	0.3	
Cadmium (Cd)	0.01	0.003	Standard for Pakistan similar to most Asian developing countries
Chloride (Cl)	< 250	250	
Chromium (Cr)	≤ 0.05	0.05	
Copper (Cu)	2	2	
Toxic Inorganic	***mg/Litre***	***mg/Litre***	
Cyanide (CN)	≤ 0.05	0.07	Standard for Pakistan similar to Asian developing countries
Fluoride (F)*	≤ 1.5	1.5	
Lead (Pb)	≤ 0.05	0.01	Standard for Pakistan similar to most Asian developing countries
Manganese (Mn)	≤ 0.5	0.5	
Mercury (Hg)	≤ 0.001	0.001	
Nickel (Ni)	≤ 0.02	0.02	
Nitrate (NO_3)*	≤ 50	50	
Nitrite (NO_2)*	≤ 3 (P)	3	
Selenium (Se)	0.01(P)	0.01	
Residual chlorine	0.2-0.5 at consumer end 0.5-1.5 at source	—	
Zinc (Zn)	5.0	3	Standard for Pakistan similar to most Asian developing countries

* indicates priority health related inorganic constituents which need regular monitoring.

Properties/Parameters	Standard Values for Pakistan	Who Standards	Remarks
Organic			
Pesticides mg/L		PSQCA No. 4639-2004, Page No. 4 Table No. 3 Serial No. 20- 58 may be consulted.***	Annex II
Phenolic compounds (as Phenols) mg/L		≤ 0.002	
Polynuclear aromatic hydrocarbons (as PAH) g/L		0.01 (By GC/MS method)	
Radioactive			
Alpha Emitters bq/L or pCi	0.1	0.1	
Beta emitters	1	1	

*** PSQCA: Pakistan Standards Quality Control Authority.

Proviso:

The existing drinking water treatment infrastructure is not adequate to comply with WHO guidelines. The Arsenic concentrations in South Punjab and in some parts of Sindh have been found high then Revised WHO guidelines. It will take some time to control arsenic through treatment process. Lead concentration in the proposed standards is higher than WHO Guidelines. As the piping system for supply of drinking water in urban centres are generally old and will take significant resources and time to get them replaced. In the recent past, Lead was completely phased out from petroleum products to cut down Lead entering into environment. These steps will enable to achieve WHO guidelines for Arsenic, Lead, Cadmium and Zinc. However, for bottled water, WHO limits for Arsenic, Lead, Cadmium and Zinc will be applicable and PSQCA Standards for all the remaining parameters.

S. R. O. 1064(I)/2010.—In exercise of the powers conferred under clause (c) of sub-section (1) of section 6 of the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the prior approval of the Pakistan Environmental Protection Council, is pleased to establish the following National Environmental Quality Standards for Noise.

National Environmental Quality Standards for Noise

S. No.	Category of Area / Zone	Effective from 1st July, 2010		Effective from 1st July, 2012	
		Limit in dB(A) Leq *			
		Day Time	Night Time	Day Time	Night Time
1.	Residential area (A)	65	50	55	45
2.	Commercial area (B)	70	60	65	55
3.	Industrial area (C)	80	75	75	65
4.	Silence Zone (D)	55	45	50	45

Note: 1. Day time hours: 6.00 a. m to 10.00 p. m.

2. Night time hours: 10.00 p. m. to 6.00 a.m.

3. Silence zone: Zones which are declared as such by the competent authority. An area comprising not less than 100 meters around hospitals, educational institutions and courts.

4. Mixed categories of areas may be declared as one of the four above-mentioned categories by the competent authority.

*dB(A) Leq: Time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

[No. F. I(12)/2010-11-General.]

MUHAMMAD KHALIL AWAN,
Section Officer (PEPC).

PRINTED BY THE MANAGER, PRINTING CORPORATION OF PAKISTAN PRESS, ISLAMABAD.
PUBLISHED BY THE DEPUTY CONTROLLER, STATIONERY AND FORMS, UNIVERSITY ROAD, KARACHI.

REGISTERED No. M-302
L. 7646

The Gazette of Pakistan

EXTRAORDINARY
PUBLISHED BY AUTHORITY

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ISLAMABD, THURSDAY, AUGUST 10, 2000

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PART-II

Statutory Notification (S.R.O)

GOVERNMENT OF PAKISTAN

MINISTRY OF ENVIRONMENT, LOCAL GOVERNMENT AND
RURAL DEVELOPMENT

NOTIFICATION

Islamabad, the 8th August 2000

S.R.O. 549 (I)/2000.___ In exercise of the powers conferred under clause (c) of sub-section (1) of section of 6 of the Pakistan environmental Protection Act. 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the prior approval of the Pakistan Environmental Protection Council, is pleased to direct that the following further amendments shall be made in its Notification No. S.R.O. 742(I)/93, dated the 24th August, 1993, namely: ___

In the aforesaid Notification, in paragraph 2._____

[4138(2000)/Ex.GAZ]

Price : Rs. 5.00

(1) for Annex, I the following shall be substituted, namely:_____

Annex-I

"NATIONAL ENVIRONMENTAL QUALITY STANDARDS FOR MUNICIPAL AND LIQUID INDUSTRIAL EFFLUENTS (mg/I, UNLESS OTHERWISE DEFINED)

S. No.	Parameter	Existing Standards	Revised Standards: Into Inland Waters	Revised Standards: Into Sewage Treatment (5)	Revised Standards: Into Sea ( )
1	2	3	4	5	6
1.	Temperature or Temperature Increase *	40^0C	≤3°C	≤3°C	≤3°C
2.	pH value (H^+) .	6-10	6-9	6-9	6-9
3.	Biochemical Oxygen Demand $(BOD)_5$ at 20^0C (1)	80	80	250	80**
4.	Chemical Oxygen Demand (COD) (1)	150	150	400	400
5.	Total Suspended Solids (TSS)	150	200	400	200
6.	Total Dissolved Solids (TDS)	3500	3500	3500	3500
7.	Oil and Grease	10	10	10	10
8.	Phenolic compounds (as phenol)	0.1	0.1	0.3	0.3
9.	Chloride (as $C1^-$)	1000	1000	1000	SC***
10.	Fluoride (as F^-)	20	10	10	10
11.	Cyanide (as CN^-) total ..	2	1.0	1.0	1.0
12.	An-ionic detergents (as MBAS) (2)	20	20	20	20
13.	Sulphate (SO_4^{2-})	600	600	1000	SC***
14.	Sulphide (S^{2-})	1.0	1.0	1.0	1.0
15.	Ammonia (NH_3)	40	40	40	40
16.	Pesticides (3)	0.15	0.15	0.15	0.15

1	2	3	4	5	6
17.	Cadmium (4)	0.1	0.1	0.1	0.1
18.	Chromium (trivalent and hexavalent (4).. ..	1.0	1.0	1.0	1.0
19.	Cooper (4)	1.0	1.0	1.0	1.0
20.	Lead (4)	0.5	0.5	0.5	0.5
21.	Mercury (4)	0.01	0.01	0.01	0.01
22.	Selenium (4)	0.5	0.5	0.5	0.5
23.	Nickel (4)	1.0	1.0	1.0	1.0
24.	Silver (4)	1.0	1.0	1.0	1.0
25.	Total toxic metals	2.0	2.0	2.0	2.0
26.	Zinc	5.0	5.0	5.0	5.0
27.	Arsenic (4)	1.0	1.0	1.0	1.0
28.	Barium (4)	1.5	1.5	1.5	1.5
29.	Iron	2.0	8.0	8.0	8.0
30.	Manganese	1.5	1.5	1.5	1.5
31.	Boron (4)	6.0	6.0	6.0	6.0
32.	Chlorine	1.0	1.0	1.0	1.0

Explanations:

1. Assuming minimum dilution 1:10 on discharge, lower ratio would attract progressively stringent standards to be determined by the Federal Environmental Protection Agency. By 1:10 dilution means, for example that for each one cubic meter of treated effluent, the recipient water body should have 10 cubic meter of water for dilution of this effluent.

2. Methylene Blue Active Substances; assuming surfactant as biodegradable.

3. Pesticides include herbicides, fungicides, and insecticides.

4. Subject to total toxic metals discharge should not exceed level given at S. N. 25.

5. Applicable only when and where sewage treatment is operational and BOD_5=80mg/I is achieved by the sewage treatment system.

6. Provided discharge is not at shore and not within 10 miles of mangrove or other important estuaries.

* The effluent should not result in temperature increase of more than 3^0C at the edge of the zone where initial mixing and dilution take place in the receiving body. In case zone is not defined, use 100 meters from the point of discharge.

** The value for industry is 200 mg/I

*** Discharge concentration at or below sea concentration (SC).

Note:_____ 1. Dilution of liquid effluents to bring them to the NEQS limiting values is not permissible through fresh water mixing with the effluent before discharging into the environment.

2. The concentration of pollutants in water being used will be substracted from the effluent for calculating the NEQS limits" and

(2) for Annex-II the following shall be substituted, namely:____

Annex-II

"NATIONAL ENVIRONMENTAL QUALITY STANDARDS FOR INDUSTRIAL GASEOUS EMISSION (mg/Nm^3, UNLESS OTHERWISE DEFINED)."

S. No.	Parameter	Source of Emission	Existing Standards	Revised Standards
1	2	3	4	5
1.	Smoke	Smoke opacity not to exceed	40% or 2 Ringlemann Scale	40% or 2 Ringlemann Scale or equivalent smoke number
2.	Particulate malter	(a) Boilers and Furnaces		
	(1)	(i) Oil fired	300	300
		(ii) Coal fired	500	500
		(iii) Cement Kilns	200	300
		(b) Grinding, crushing, Clinker coolers and Related processes, Metallurgical Processes, converter, blast furnaces and cupolas.	500	500
3.	Hydrogen Chloride	Any	400	400

1	2	3	4	5
4.	Chlorine	Any	150	150
5.	Hydrogen Fluoride	Any	150	150
6.	Hydrogen Sulphide	Any	10	10
7.	Sulphur Oxides (2) (3)	Sulfuric acid/Sulphonic acid plants		
		Other Plants except power Plants operating on oil and coal	400	1700
8.	Carbon Monoxide	Any	800	800
9.	Lead	Any	50	50
10.	Mercury	Any	10	10
11.	Cadmium	Any	20	20
12.	Arsenic	Any	20	20
13.	Copper	Any	50	50
14.	Antimony	Any	20	20
15.	Zinc	Any	200	200
16.	Oxides of Nitrogen	Nitric acid manufacturing unit.	400	3000
	(3)	Other plants except power plants operating on oil or coal:		
		Gas fired	400	400
		Oil fired	-	600
		Coal fired	-	1200

Explanations:-

1. Based on the assumption that the size of the particulate is 10 micron or more.

2. Based on 1 percent Sulphur content in fuel oil. Higher content of Sulphur will case standards to be pro-rated.

3. In respect of emissions of Sulphur dioxide and Nitrogen oxides, the power plants operating on oil and coal as fuel shall in addition to National Environmental Quality Standards (NEQS) specified above, comply with the following standards:-

A. **Sulphur Dioxide**

Sulphur Dioxide Background levels Micro-gram per cubic meter (ug/m^3) Standards.

Background Air Quality (SO_2 Basis)	Annual Average	Max. 24-hours Interval	Criterion I Max. SO_2 Emission (Tons per Day Per Plant)	Criterion II Max. Allowable ground level increment to ambient (ug/m^3) (One year Average)
Unpolluted	<50	<200	500	50
Moderately Polluted*				
Low	50	200	500	50
High	100	400	100	10
Very Polluted**	>100	>400	100	10

* For intermediate values between 50 and 100 ug/m^3 linear interpolations should be used.

** No projects with Sulphur dioxide emissions will be recommended.

B. Nitrogen Oxide

Ambient air concentrations of Nitrogen oxides, expressed as NO_x should not be exceed the following:-

Annual Arithmetic Mean 100ug/m^3 (0.05 ppm)

Emission level for stationary source discharge before missing with the atmosphere, should be maintained as follows:-

For fuel fired steam generators as Nanogram (10^0-gram) per joule of heat input:

Liquid fossil fuel	130
Solid fossil fuel	300
Lignite fossil fuel	260

Note:- Dilution of gaseous emissions to bring them to the NEQS limiting value is not permissible through excess air mixing blowing before emitting into the environment.

[File No. 14(3)/98-TO-PEPC.]

HAFIZ ABDULAH AWAN
DEPUTY SECRETARY (ADMN)

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Annexure V

Environmental Monitoring Reports

Premier Motors Limited (PML)
Proposed Project Site (PML)

Meteorological Data

Client / Account : **Premier Motors Limited**

Location : **Proposed Project Site (PML)**

Sampling Point ID : **Premier Motor Side**

Date of Intervention : **12-Apr-19**

Time (Hrs)	Temperature	Wind Direction	Wind Speed	Humidity	Atmospheric Pressure (mmHg)
	°C		m/s	%	
10:00	30.1	E	1.2	66.0	757.8
11:00	30.4	SE	0.6	62.0	757.9
12:00	31.5	E	2.1	57.0	757.4
13:00	31.0	E	1.3	60.0	756.4
14:00	30.4	SE	0.7	65.0	756.4
15:00	30.8	SE	1.3	62.0	755.4
16:00	30.2	SE	0.8	65.0	755.3
17:00	30.1	SE	1.0	63.0	756.6

Ambient Air Quality Data

Client / Account : **Premier Motors Limited**

Location : **Proposed Project Site (PML)**

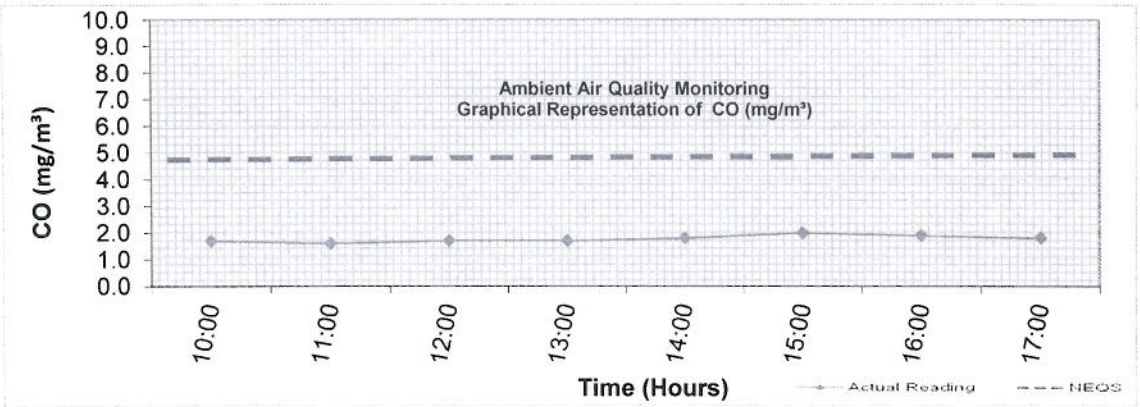
Sampling Point ID : **Premier Motor Side**

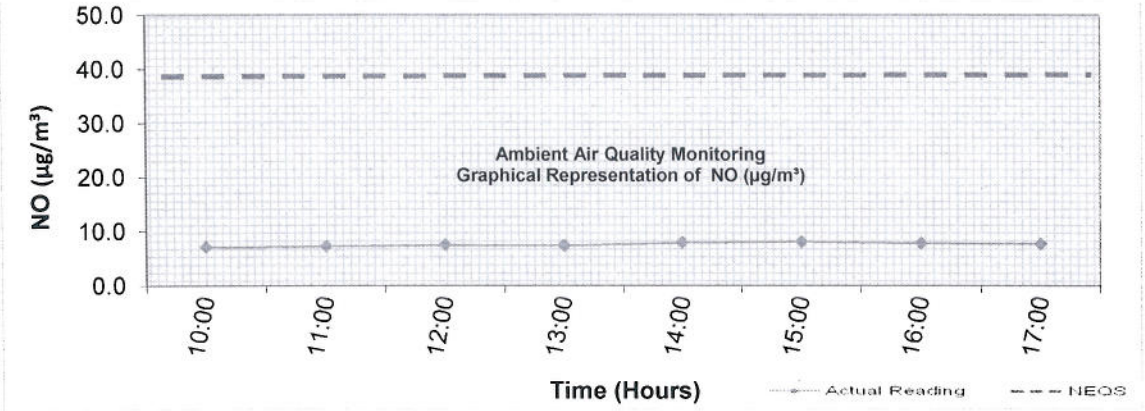
Date of Intervention : **12-Apr-19**

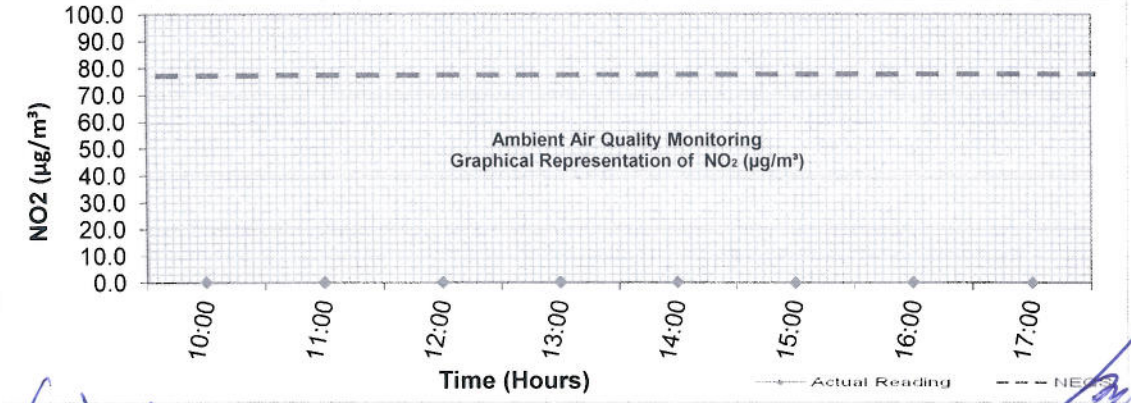
Sr. #	Time	CO (mg/m^3)	NO (µg/m^3)	NO_2 (µg/m^3)	NO_x (µg/m^3)	SO_2 (µg/m^3)
1	10:00	1.7	7.1	0.2	7.3	1.2
2	11:00	1.6	7.3	0.0	7.3	1.3
3	12:00	1.7	7.5	0.1	7.6	2.3
4	13:00	1.7	7.4	0.1	7.5	1.6
5	14:00	1.8	7.9	0.2	8.1	1.7
6	15:00	2.0	8.1	0.0	8.1	1.8
7	16:00	1.9	7.8	0.1	7.9	1.6
8	17:00	1.8	7.7	0.1	7.8	1.5
08 Hours Average		1.8	7.6	0.1	7.7	1.6

Premier Motors Limited

Graphical Representation

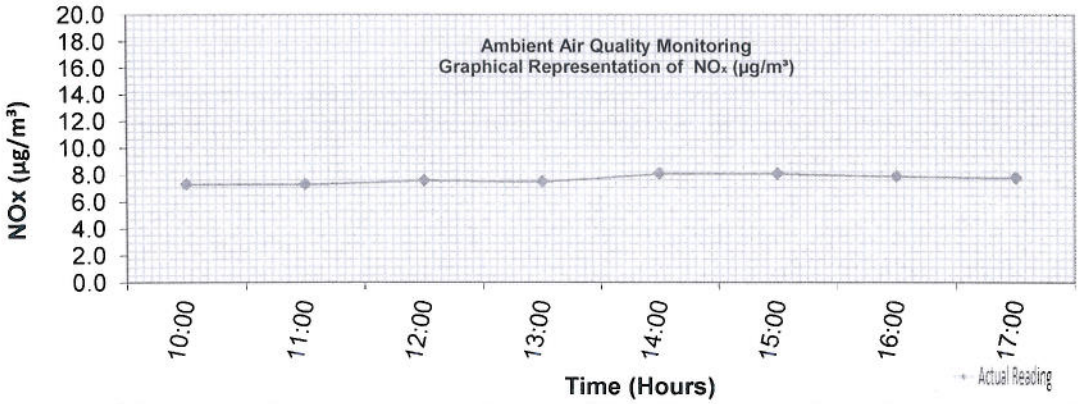


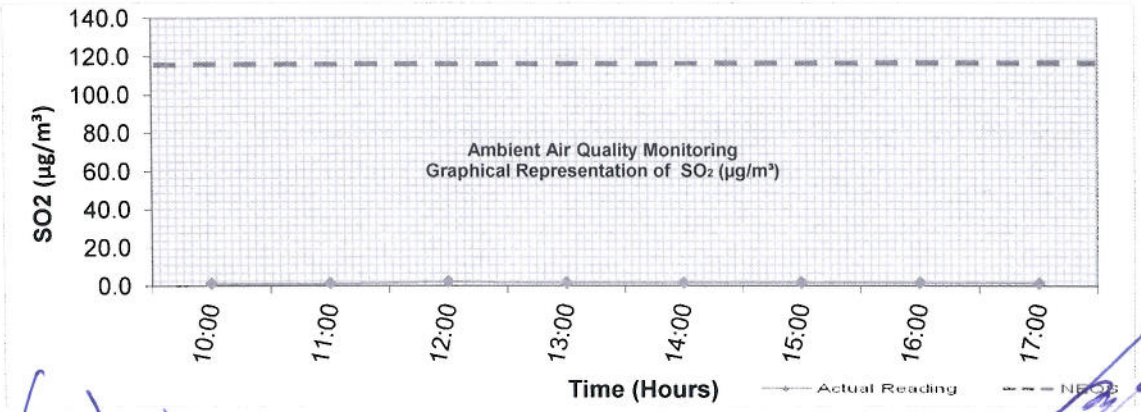




Premier Motors Limited

Graphical Representation





Average Results

Client / Account : **Premier Motors Limited**

Location : **Proposed Project Site (PML)**

Sampling Point ID : **Premier Motor Side**

Date of Intervention : **12-Apr-19**

Parameters	Unit	Duration	Average Concentration	NEQS Limits
Carbon Monoxide (CO)	mg/m^3	08 Hours	1.8	5.0*
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	08 Hours	0.1	80**
Nitrogen Oxide (NO)	$\mu g/m^3$	08 Hours	7.6	40**
Sulfur Dioxide (SO_2)	$\mu g/m^3$	08 Hours	1.6	120**
Total Suspended Particulate (TSP)	$\mu g/m^3$	08 Hours	153.7	500**
Particulate Matter (PM_{10})	$\mu g/m^3$	08 Hours	107.7	150**
Particulate Matter ($PM_{2.5}$)	$\mu g/m^3$	08 Hours	27.8	75**
Ozone (O_3)	ppb	08 Hours	8.6	130***
Lead (Pb)	$\mu g/m^3$	08 Hours	<01.0	1.5**

NEQS : National Environmental Quality Standards
$\mu g/m^3$: micro grams per cubic meter
mg/m^3 : miligram per meter cube.
ppm : part per million
ND : Not Detected
* NEQS limit of CO as per 8 hours
** NEQS limit for 24 hours
*** NEQS Limit of Ozone as per 1 hour measurement

NOISE LEVEL MONITORING

ANNEXURE - A

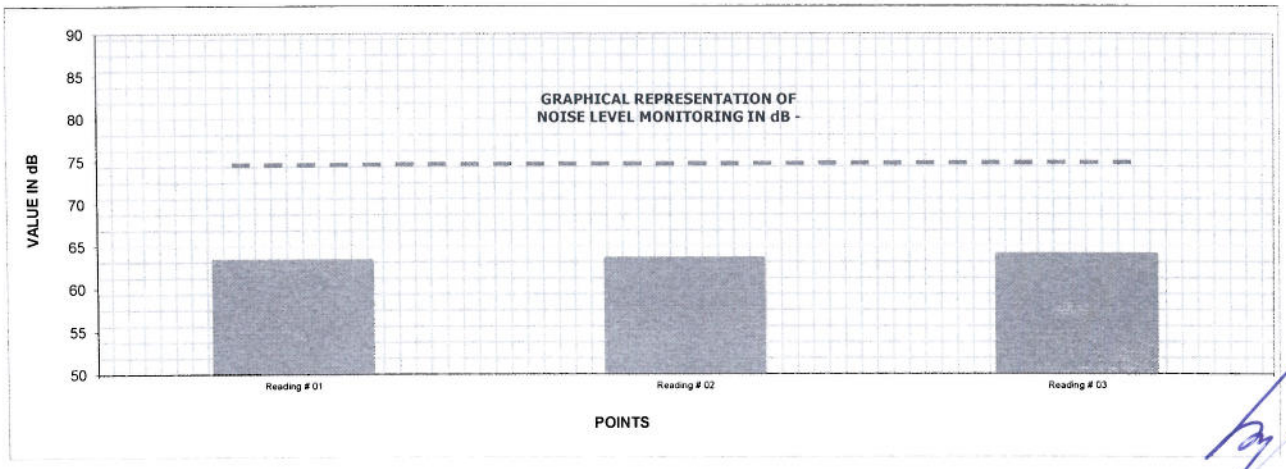
CLIENT : **Premier Motors Limited** Our Ref.: EHS - 094 / 2019

DATE OF INTERVENTION : 12-Apr-19 **Report Date:** 03-May-19

MONITORING SITE: **Proposed Project Site (PML), Balochistan** Page 01 of 04

POINT 1		
SR. #	**READING**	**NOISE LEVEL MONITORING in dB**
1	Reading # 01	63.20
2	Reading # 02	63.40
3	Reading # 03	63.90

NOTE : As per National Environmental Quality Standard " Permissible noise exposures for industries at day time is 75 decibels"



NEQS Limits :

Actual Readings :

- ISSUED WITHOUT PREJUDICE.
- OUR SERVICES CARRIED OUT IN ACCORDANCE TO THE GENERAL CONDITIONS OF SERVICES.

NOISE LEVEL MONITORING

ANNEXURE - A

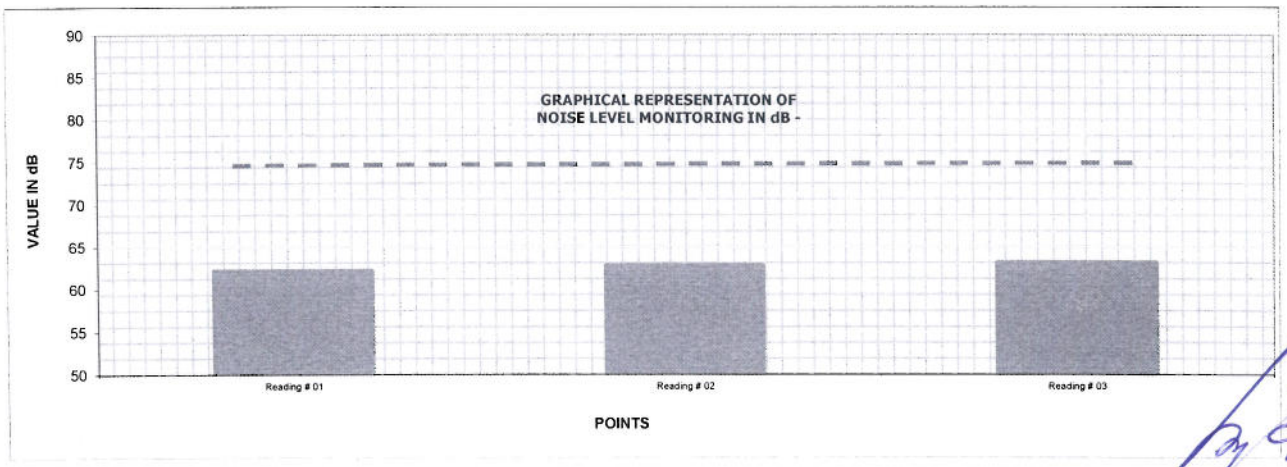
CLIENT : **Premier Motors Limited** Our Ref.: EHS - 094 / 2019

DATE OF INTERVENTION : 12-Apr-19 **Report Date:** 03-May-19

MONITORING SITE: **Proposed Project Site (PML), Balochistan** Page 02 of 04

POINT 2		
SR. #	**READING**	**NOISE LEVEL MONITORING in dB**
1	Reading # 01	62.10
2	Reading # 02	62.70
3	Reading # 03	63.10

NOTE : As per National Environmental Quality Standard " Permissible noise exposures for industries at day time is 75 decibels"



NEQS Limits :

Actual Readings :

- ISSUED WITHOUT PREJUDICE.
- OUR SERVICES CARRIED OUT IN ACCORDANCE TO THE GENERAL CONDITIONS OF SERVICES.

CONT 07 02

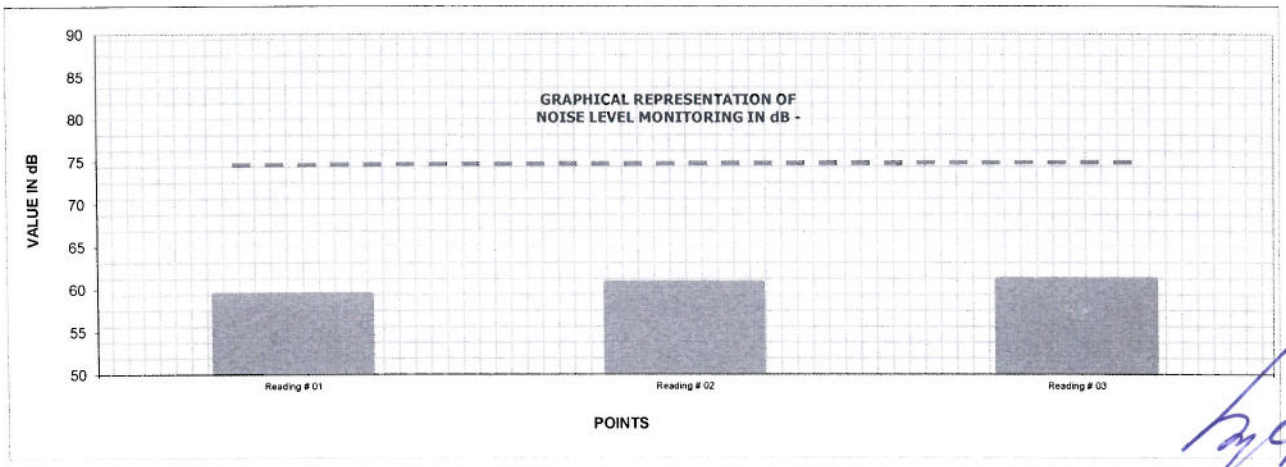
NOISE LEVEL MONITORING

ANNEXURE - A

CLIENT :	**Premier Motors Limited**	Our Ref.: EHS - 094 / 2019
DATE OF INTERVENTION :	12-Apr-19	**Report Date:** 03-May-19
MONITORING SITE:	**Proposed Project Site (PML), Balochistan**	Page 03 of 04

POINT 3		
SR. #	**READING**	**NOISE LEVEL MONITORING in dB**
1	Reading # 01	59.40
2	Reading # 02	60.70
3	Reading # 03	61.10

NOTE : As per National Environmental Quality Standard " Permissible noise exposures for industries at day time is 75 decibels"



NEQS Limits :

Actual Readings :

- ISSUED WITHOUT PREJUDICE.
- OUR SERVICES CARRIED OUT IN ACCORDANCE TO THE GENERAL CONDITIONS OF SERVICES.

NOISE LEVEL MONITORING

ANNEXURE - A

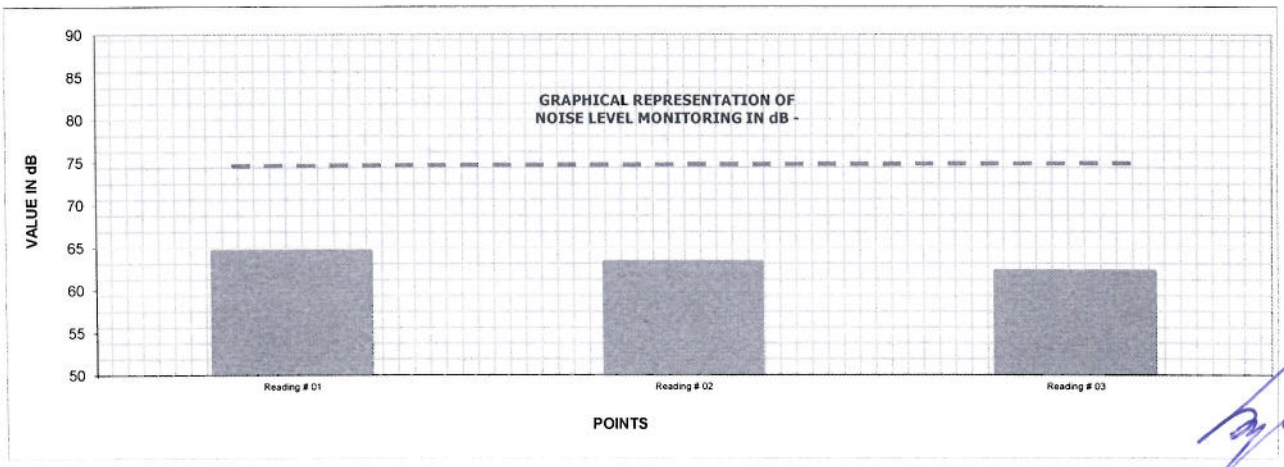
CLIENT : **Premier Motors Limited** Our Ref.: EHS - 094 / 2019

DATE OF INTERVENTION : 12-Apr-19 **Report Date:** 03-May-19

MONITORING SITE: **Proposed Project Site (PML), Balochistan** Page 01 of 04

POINT 4		
SR. #	**READING**	**NOISE LEVEL MONITORING in dB**
1	Reading # 01	64.50
2	Reading # 02	63.20
3	Reading # 03	62.10

NOTE : As per National Environmental Quality Standard " Permissible noise exposures for industries at day time is 75 decibels"

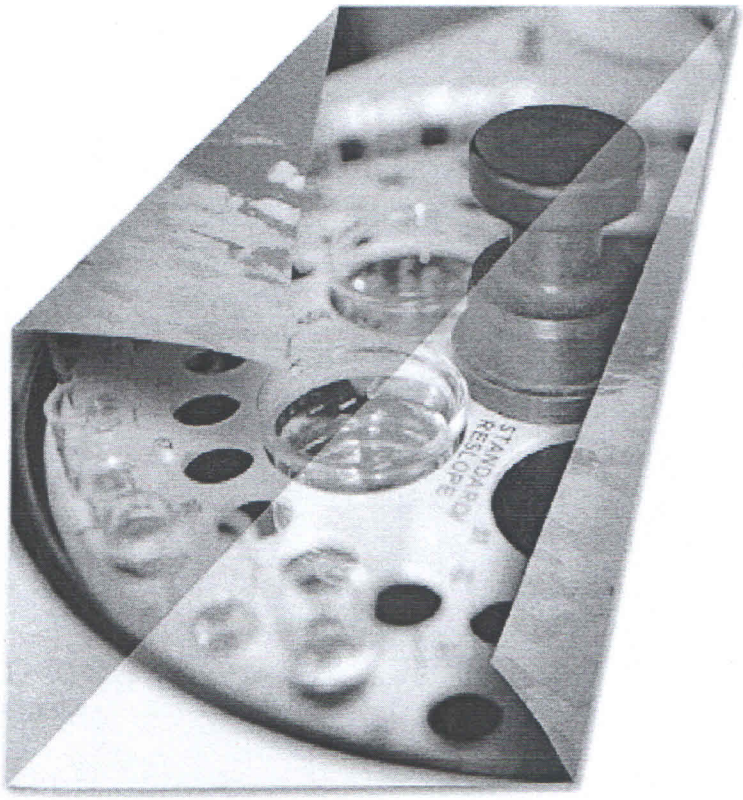


NEQS Limits :

Actual Readings :

- ISSUED WITHOUT PREJUDICE.
- OUR SERVICES CARRIED OUT IN ACCORDANCE TO THE GENERAL CONDITIONS OF SERVICES.

SGS



ANALYTICAL REPORT

WATER ANALYSIS

MULTIPLE PARAMETER ANALYSIS / EHS – 094 / 2019

PREPARED FOR:

PREMIER MOTORS LIMITED

ANALYTICAL REPORT

CLIENT DETAILS

Client	Premier Motors Limited
Sampling Location	Proposed Premier Motors Plant.
Contact	Mr. Ijaz
Cell	92 21 32456494
Fax	-
Email	Ijaz.ahmed@premier.com.pk
Project	Environmental Impact Assessment (EIA)
Order Number	EHS-094/2019
Sample	Water Samples

LABORATORY DETAILS

Manager	Iqbal Ashraf
Laboratory	Chemical & Environmental Laboratory
Address	H-3/3, Sector- 5, Korangi Industrial Area Karachi. 74900.
Telephone	+92-21-35121388-97
Fax	+92-21-35121329
Email	Iqbal_ashraf@sgs.com , Karachi.environment@sgs.com
SGS Reference	EHS- Lab-9174/2019
Sample Collected	22-April-2019
Report Number	-
Date Reported	08-May -2019

COMMENTS

This report is not valid for any negotiation.

The remaining portion of the sample (s) will be disposed off after one week unless otherwise instructed. (Conditions Apply)

SIGNATORIES

Syed Zeeshan Ali
Deputy Manager Laboratory

Iqbal Ashraf
Deputy Manager Laboratory

ANALYTICAL REPORT

Sample No.			EHS-Lab-9174/2019-001	EHS-Lab-9174/2019-002	EHS-Lab-9174/2019-003	EHS-Lab-9174/2019-004
Client ID			Sample # 01	Sample # 02	Sample # 03	Sample # 04
Sample Matrix			Well Water	Drinking Water Tanker	Goth Abbas Ground Water	Hub River Surface Water
Sample Date			22-04-2019	22-04-2019	22-04-2019	22-04-2019
Sample Receipt Date			22-04-2019	22-04-2019	22-04-2019	22-04-2019
Sampled B			SGS Personnel	SGS Personnel	SGS Personnel	SGS Personnel
Parameter	Units	LOR	Result	Result	Result	Result
Color APHA-2120 B/C 22nd Edition						
Color	Pt-Co	05.00	16.00	18.00	20.00	25.50
pH APHA 4500H+ B 22nd Edition						
*pH at 25 °C	pH unit	00.10	07.80	07.53	07.24	07.79
Total Dissolved Solid APHA 2540 C 22nd Edition						
*Solids, Total dissolved (TDS)	mg/L	05.00	8572.00	2888.00	6732.00	3422.00
Total Hardness APHA 2340 B 22nd Edition						
*Hardness, Total as $CaCO_3$	mg/L	00.05	2323.35	774.56	1752.02	762.97
Fluoride APHA 4110 C 22nd Edition						
Fluoride (F^-)	mg/L	0.050	1.232	0.641	0.934	0.688
Nitrogen, Nitrate (NO_3) APHA 4110 C 22nd Edition						
Nitrate (NO_3^-) – Nitrogen	mg/L	0.003	15.040	0.500	0.600	0.350
Nitrogen, Nitrite(NO_2^-) APHA 4110 C 22nd Edition						
Nitrite (NO_2^-)– Nitrogen	mg/L	0.003	<0.003	<0.003	<0.003	<0.003
Metals by ICP-OES 3120 B 22nd Edition						
Cadmium (Cd)	mg/L	0.003	<0.003	<0.003	<0.003	<0.003
Chromium (Cr)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005
Copper (Cu)	mg/L	0.005	<0.005	0.007	<0.005	<0.005
Lead (Pb)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005
Nickel (Ni)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005
Zinc (Zn)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005
Manganese (Mn)	mg/L	0.005	0.007	0.011	0.009	<0.005
Aluminum (Al)	mg/L	0.005	0.264	0.026	<0.005	<0.005
Antimony (Sb)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005
Boron (B)	mg/L	0.005	1.898	0.575	0.730	1.005
Selenium (Se)	mg/L	0.005	0.016	0.023	0.027	0.031
Barium (Ba)	mg/L	0.005	0.031	0.048	0.026	0.039
Mercury by ICP-OES APHA 3112 B 22nd Edition						
Mercury (Hg)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Chloride APHA-4500Cl- B 22nd Edition						
*Chloride	mg/L	05.00	3338.43	1107.04	2754.64	1245.42
Chlorine APHA 4500 G 22nd Edition						
Chlorine (Residual)	mg/L	00.02	<00.02	<00.02	<00.02	<00.02
Cyanide APHA 4500 CN F 22nd Edition						
Cyanide (CN^-)	mg/L	00.01	<00.01	<00.01	<00.01	<00.01
Total Phenols APHA 5530 D 22nd Edition						
Phenols, Total (Phenolic Compounds)	mg/L	0.002	<0.002	<0.002	<0.002	<0.002

End of Report

FOOTNOTE

IS	Insufficient sample for analysis.
LOR	Limits of Reporting
TCC	Total Colony Count
P/A	Present / Absent
MPN	Most Probable Number
TPC	Total Plate Count
HPC	Heterotrophic Plate count
APC	Aerobic Plate Count
TVA	Total Viable Count & Total Becteria
FDA	Food & Drug Administration of USA
BAM	Bacteriological Analytical Manual
LNR	Sample Listed, but not received
Cfu	Colony forming unit
*	This analysis is covered by the scope of accreditation Uncertainty of the test can be provided upon request.
***	Parameters subcontracted. ND Means not Detected.
**	Effluent Temperature should not increase ≤3 0C from receiving body Temperature Effluent Temperature = 34 °C Receiving Body Temperature = Not Available
^	Performed by the outside laboratory
<	Values less than reporting limit
NEQS	National Environmental Quality Standard

Sample analyzed as received.

CHEMICAL & ENVIRONMENTAL LABORATORY (KHI.)

TEST REPORT

Client Name: **Premier Motors Limited**

Sampling Location: **Proposed Premier Motors Plant.**

Description of Sample: **Soil Samples**

Marking (If Any) : **Gavin Below** **No. Of Samples :** **02**

Sample Condition Upon Receipt: **Satisfactory & Unsealed** **Date :** **16-04-2019**

Sr.#	Parameters	Method	Unit	Ldl	Test Results	
					Point # 01	Point # 02
01	pH	USEPA-9045 C	-	-	08.08	08.08
02	Electrical Conductivity	IS0-11265:1994	µS/cm	0.0001	288.00	217.00
03	Oil & Grease	In house Gravimetric	mg/Kg	10.00	332.66	379.16
04	Chloride (water soluble)	Based on APHA 4500Cl-B	mg/Kg	01.00	107.26	83.18
05	Silver (Ag)	Based on USEPA 3050B	mg/kg	00.50	<00.50	<00.50
06	Arsenic (As)	Based on USEPA 3050B	mg/kg	00.50	07.25	06.10
07	Zinc (Zn)	Based on USEPA 3050B	mg/kg	00.50	16.70	16.74
08	Barium (Ba)	Based on USEPA 3050B	mg/kg	00.50	34.69	33.68
09	Cadmium (Cd)	Based on USEPA 3050B	mg/kg	00.50	<00.50	<00.50
10	Chromium (Cr)	Based on USEPA 3050B	mg/kg	00.50	13.10	13.84
11	Mercury (Hg)	Based on USEPA 7471B	mg/kg	0.050	<0.050	<0.050
12	Lead (Pb)	Based on USEPA 3050B	mg/kg	00.50	05.85	04.95
13	Selenium (Se)	Based on USEPA 3050B	mg/kg	00.50	<00.50	<00.50

Remarks: Ldl Means... Lowest Detection Limit < Means... Less Than. # Results will follow soon.
Analysis conducted on as received Basis. *Analysis conducted on Dry Basis.

- This report is not valid for any negotiation.
- This report pertains only to the sample (s) supplied and is issued without prejudice.
- The remaining portion of the sample (s) will be disposed off after one week unless otherwise instructed (Conditions Apply).
- The sample(s) to which the findings recorded herein (the "Findings") relate was (were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

For and on behalf of,

SGS PAKISTAN (PVT) LTD.

DM (QA) **DM**

Annexure VI

List of Stakeholder Consultation & Survey Forms

Sr.	*Government and Non-Government Departments*	*Official Name/Designation*
1.	Environmental Protection Agency Balochistan, Hub office	• Mr Muhammad Moosa (Research Asst.) • Mr Abdul Hakeem (Research Asst.)
2.	Irrigation Department Hub, Balochistan.	• Mr. Sikandar (Executive Eng.) • Mr Meer Muhammad (junior Eng.)
3.	Wildlife Department of lasbela district, Balochistan	• Mr. Raja Asif latif (Deputy Conservator) • Mr. Abdur Rehman (Sub division officer)
4.	Forest Department of lasbela district, Balochistan	• Mr Maqbool Hassan Rashdi (Deputy Conservator)
5.	Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS)	• Dr. Muhammad Shafi (Dean of marine-sciences), • Dr. Mureed Hussain Khosa (HOD Geology) • Dr. Abdul Hakeem (HOD Environmental) • Dr. Muhsan Ali (Assistant Prof.)
6.	DHO (District Health Office), Lasbela	• Mr Qader bukhsh (Nutritionist)
7.	NSRP (National Rural Support Programme) Hub, Balochistan.	• Mr Siraj Ahmed (District program officer) • Mr Wajid Ali (field officer)
8.	The Citizens Foundation (**TCF**), Goth Abbas	• Mr. Captain Irfan
9.	Govt Degree College Hub, Balochistan	• Mr. Abdul Rehman

EIA for the Construction and Operation of Automotive Plant, Hub, Balochistan.

Project Proponent: Premier Motors Limited

Interview Schedule

Name of interviewer	Irfan. Ali
Date	18th - April - 2019

DEMOGRAPHIC SURVEY				
1. Name of the Interviewee: Jumma Khan Signature: Jum Mobile: 0302-2605936 Date: 18th - April - 2019				
2. Location/ Address and Identification (ID Card etc):				
Goth Abbas				
3. Gender	M ✓	F	Age	60
4. Educational Status:				
a. Illiterate				
✓ b.Basic Education				
c.Matric and Intermediate				
d.Graduate and Post Graduate				
5. Profession	Land owner & Personal Business			
6. Marital status	✓ Married	Unmarried		
7. No of Peoples in the household	a. Male 4	b. Female 3		

SGS

8. No of Children and Ages	a. Male	b. Female
	1	0

INDUSTRIAL AND LABOR
9. What is your source of income?
Land loard & Personal Business
10. Average monthly income: –
11. Number of family members employed (Male, Female): –
Type of Employment: –
Where: –

Family members seeking employment
12. Number: –
13. Type of Job: –
14. Education Level: –
15. Previous Employment: –

SOCIAL ISSUES
16. What are the main difficulties that your family experiences? (e.g., water supply, unemployment, poor health services etc.)
water, health and electsicity
17. Of these difficulties, which are of the greatest concern to you?
water and health

SGS

18. In your opinion, what could be done to manage these difficulties better?
water well must be dug for water supply & Medical camps and hospitals must be constructed

For Agriculturalist
19. What are the major types of crops grown in the project area? Sapota (Chicku), Bhaj
20. Are these crops sold commercially or Self Consummated?
21. What is source of irrigation water? Rain water & groundwater
22. Are women engaged in agricultural activities? Yes.

COMMUNITY HEALTH & HEALTHCARE SYSTEM
23. What are important health concerns of community? Try and be specific (e.g. respiratory, gastrointestinal, accidents, injuries) (ask about health of children, old people, men, women)
24. Which is the nearest Basic Healthcare Facility available in your area?
Zahid hospital & Civil hospital hub chauki
25. Are you happy with the healthcare facility? No
26. How often do you go there and for what reasons? Flu, fever, Body pain
27. Are medicines available at the facility? No

PUBLIC PERCEPTION ABOUT PROPOSED AUTOMOTIVE PLANT

SGS

Do you know about this project?	Yes ✓	No
Do you think, this project has Impacts?	Yes ✓	No
If yes, then EXPLAIN?		
Employment opportunities		
Did you face any problem (Environmental/Social) with this project?		
If yes then What are your suggestions? No		
Suggestions:		

PUBLIC PERCEPTION ABOUT THIS PROPOSED PROJECT		
What are your perceived benefits from this project?		
Better facilities for life will be in reach		
In your opinion, should this project be implemented here?	Yes ✓	No
Do you think that the project will affect your lifestyle?		
Yes		
What protective measures do you suggest during construction of proposed highway to safeguard your interests?		
Protective measures: /		

SGS

EIA for the Construction and Operation of Automotive Plant, Hub, Balochistan.

Project Proponent: Premier Motors Limited

Interview Schedule

Name of interviewer	Irfan Ali
Date	19th - April - 2019

DEMOGRAPHIC SURVEY				
1. Name of the Interviewee: Muhammad Shafi Signature: Mobile: Date: 19th April - 2019				
2. Location/ Address and Identification (ID Card etc):				
Goth Abbas.				
3. Gender	M ✓	F	Age	58
4. Educational Status:				
a. Illiterate				
✓ b.Basic Education				
c.Matric and Intermediate				
d.Graduate and Post Graduate				
5. Profession	Puncture Shop owner.			
6. Marital status	✓ Married		Unmarried	
7. No of Peoples in the household		a. Male 4	b. Female 4	

SGS

8. No of Children and Ages	a. Male 2	b. Female 2

INDUSTRIAL AND LABOR
9. What is your source of income? —
10. Average monthly income: —
11. Number of family members employed (Male, Female): —
Type of Employment: —
Where: —

Family members seeking employment
12. Number: —
13. Type of Job: —
14. Education Level: —
15. Previous Employment: —

SOCIAL ISSUES
16. What are the main difficulties that your family experiences? (e.g., water supply, unemployment, poor health services etc.) water, health, electricity, poor roads.
17. Of these difficulties, which are of the greatest concern to you? water & health services.

SGS

18. In your opinion, what could be done to manage these difficulties better?
water lining and construction of hospital

For Agriculturalist	
19. What are the major types of crops grown in the project area?	–
20. Are these crops sold commercially or Self Consummated?	–
21. What is source of irrigation water?	–
22. Are women engaged in agricultural activities?	–

COMMUNITY HEALTH & HEALTHCARE SYSTEM
23. What are important health concerns of community? Try and be specific (e.g. respiratory, gastrointestinal, accidents, injuries) (ask about health of children, old people, men, women)
24. Which is the nearest Basic Healthcare Facility available in your area?
Zahid hospital hub, chauki
25. Are you happy with the healthcare facility? No
26. How often do you go there and for what reasons? Pain in Body, flu, fever
27. Are medicines available at the facility? No

PUBLIC PERCEPTION ABOUT PROPOSED AUTOMOTIVE PLANT

Do you know about this project?	Yes ✓	No
Do you think, this project has Impacts?	Yes ✓	No
If yes, then EXPLAIN?		
Better roads and utilities will be in the area.		
Did you face any problem (Environmental/Social) with this project?		
If yes then What are your suggestions? No		
Suggestions:		

PUBLIC PERCEPTION ABOUT THIS PROPOSED PROJECT		
What are your perceived benefits from this project?		
Area developement.		
In your opinion, should this project be implemented here?	Yes ✓	No
Do you think that the project will affect your lifestyle?		
Yes		
What protective measures do you suggest during construction of proposed highway to safeguard your interests?		
Protective measures: /		

SGS

EIA for the Construction and Operation of Automotive Plant, Hub, Balochistan.

Project Proponent: Premier Motors Limited

Interview Schedule

Name of interviewer	Muhammad Bilal
Date	18th-April-2019

DEMOGRAPHIC SURVEY				
1. Name of the Interviewee: Saifullah Signature: Saif Mobile: 0301-2579374 Date: 18th-April-2019				
2. Location/ Address and Identification (ID Card etc):				
Goth Abbas.				
3. Gender	M ✓	F	Age	25
4. Educational Status:				
a. Illiterate				
b.Basic Education				
c.Matric and Intermediate				
✓ d.Graduate and Post Graduate				
5. Profession				
6. Marital status	✓ Married	Unmarried		
7. No of Peoples in the household	a. Male 4	b. Female 2		

SGS

8. No of Children and Ages	a. Male 2	b. Female 1

INDUSTRIAL AND LABOR
9. What is your source of income?
10. Average monthly income:
11. Number of family members employed (Male, Female):
Type of Employment:
Where:

Family members seeking employment	
12. Number:	01
13. Type of Job:	office or technical.
14. Education Level:	Graduate
15. Previous Employment:	–

SOCIAL ISSUES
16. What are the main difficulties that your family experiences? (e.g., water supply, unemployment, poor health services etc.)
All the basic facilities including electricity, water, gas, health & unemployment
17. Of these difficulties, which are of the greatest concern to you?
Unemployment, water and hospital.

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18. In your opinion, what could be done to manage these difficulties better?
Proper. water system must be developed. Electricity must be provided so that people can run cottage industries

For Agriculturalist	
19. What are the major types of crops grown in the project area?	Veg & fruits (Sopata)
20. Are these crops sold commercially or Self Consummated?	
21. What is source of irrigation water?	Rain water & ground water
22. Are women engaged in agricultural activities?	Yes.

COMMUNITY HEALTH & HEALTHCARE SYSTEM
23. What are important health concerns of community? Try and be specific (e.g. respiratory, gastrointestinal, accidents, injuries) (ask about health of children, old people, men, women)
24. Which is the nearest Basic Healthcare Facility available in your area?
Zahid hospital, Hub chauk.
25. Are you happy with the healthcare facility? No
26. How often do you go there and for what reasons?
fever, flu, others
27. Are medicines available at the facility? No.

PUBLIC PERCEPTION ABOUT PROPOSED AUTOMOTIVE PLANT

Do you know about this project?	Yes ✓	No
Do you think, this project has Impacts?	Yes ✓	No
If yes, then EXPLAIN?		
Positive Impact on Community inform of area development.		
Did you face any problem (Environmental/Social) with this project?		
If yes then What are your suggestions?		
Suggestions: NO		

PUBLIC PERCEPTION ABOUT THIS PROPOSED PROJECT		
What are your perceived benefits from this project?		
Better employment opportunities		
In your opinion, should this project be implemented here?	Yes ✓	No
Do you think that the project will affect your lifestyle?		
Yes.		
What protective measures do you suggest during construction of proposed highway to safeguard your interests?		
Protective measures: /		

SGS

EIA for the Construction and Operation of Automotive Plant, Hub, Balochistan.

Project Proponent: Premier Motors Limited

Interview Schedule

Name of interviewer	Muhammad Bilal
Date	19th - April - 2019

DEMOGRAPHIC SURVEY				
1. Name of the Interviewee: Badal Signature: Badal Mobile: Date: 19/04/2019				
2. Location/ Address and Identification (ID Card etc):				
Goth Abbas				
3. Gender	M ✓	F	Age	40
4. Educational Status:				
a. Illiterate				
✓ b.Basic Education				
c.Matric and Intermediate				
d.Graduate and Post Graduate				
5. Profession	Farm Owner.			
6. Marital status	✓ Married		Unmarried	
7. No of Peoples in the household	a. Male 4		b. Female 2	

SGS

8. No of Children and Ages	a. Male 1	b. Female 2

INDUSTRIAL AND LABOR
9. What is your source of income?
Farming & labour
10. Average monthly income: –
11. Number of family members employed (Male, Female): –
Type of Employment:
Where:

Family members seeking employment
12. Number: –
13. Type of Job: –
14. Education Level: –
15. Previous Employment: –

SOCIAL ISSUES
16. What are the main difficulties that your family experiences? (e.g., water supply, unemployment, poor health services etc.)
Water, health, electricity
17. Of these difficulties, which are of the greatest concern to you?
Water and health services

SGS

18. In your opinion, what could be done to manage these difficulties better?
Proper water lining should be done.

For Agriculturalist	
19. What are the major types of crops grown in the project area?	Veg & fruits
20. Are these crops sold commercially or Self Consummated?	
21. What is source of irrigation water?	Ground water
22. Are women engaged in agricultural activities?	No

COMMUNITY HEALTH & HEALTHCARE SYSTEM
23. What are important health concerns of community? Try and be specific (e.g. respiratory, gastrointestinal, accidents, injuries) (ask about health of children, old people, men, women)
24. Which is the nearest Basic Healthcare Facility available in your area?
Zahid hospital, hub chauki
25. Are you happy with the healthcare facility? Yes
26. How often do you go there and for what reasons?
flu, fever.
27. Are medicines available at the facility? No

PUBLIC PERCEPTION ABOUT PROPOSED AUTOMOTIVE PLANT

Do you know about this project?	Yes ✓	No
Do you think, this project has Impacts?	Yes ✓	No
If yes, then EXPLAIN?		
Area & its surrounding Development.		
Did you face any problem (Environmental/Social) with this project?		
No		
If yes then What are your suggestions?		
Suggestions: No		

PUBLIC PERCEPTION ABOUT THIS PROPOSED PROJECT		
What are your perceived benefits from this project?		
Better life standard.		
In your opinion, should this project be implemented here?	Yes ✓	No
Do you think that the project will affect your lifestyle?		
Yes.		
What protective measures do you suggest during construction of proposed highway to safeguard your interests?		
Protective measures: /		

SGS

EIA for the Construction and Operation of Automotive Plant, Hub, Balochistan.

Project Proponent: Premier Motors Limited

Interview Schedule

Name of interviewer	Irfan Ali
Date	19th - April - 2019

DEMOGRAPHIC SURVEY				
1. Name of the Interviewee: Ali Murad Signature: Ali Mobile: 0301-2579374 Date: 19th - April - 2019				
2. Location/ Address and Identification (ID Card etc):				
Goth Abbas.				
3. Gender	M ✓	F	Age	43
4. Educational Status:				
a. Illiterate				
✓ b.Basic Education				
c.Matric and Intermediate				
d.Graduate and Post Graduate				
5. Profession	General store owner			
6. Marital status	✓ Married		Unmarried	
7. No of Peoples in the household	a. Male 3		b. Female 3	

SGS

8. No of Children and Ages	a. Male 1	b. Female 2

INDUSTRIAL AND LABOR
9. What is your source of income?
10. Average monthly income:
11. Number of family members employed (Male, Female):
Type of Employment:
Where:

Family members seeking employment
12. Number:
13. Type of Job:
14. Education Level:
15. Previous Employment:

SOCIAL ISSUES
16. What are the main difficulties that your family experiences? (e.g., water supply, unemployment, poor health services etc.)
Poor health services and Electric and water supply
17. Of these difficulties, which are of the greatest concern to you?
All of the above

SGS

18. In your opinion, what could be done to manage these difficulties better? Hospital and Medical camps must be developed.

For Agriculturalist
19. What are the major types of crops grown in the project area? Vegs and fruits.
20. Are these crops sold commercially or Self Consummated? ✓
21. What is source of irrigation water? Rain water
22. Are women engaged in agricultural activities? Yes

COMMUNITY HEALTH & HEALTHCARE SYSTEM
23. What are important health concerns of community? Try and be specific (e.g. respiratory, gastrointestinal, accidents, injuries) ✓ ✓ ✓ (ask about health of children, old people, men, women)
24. Which is the nearest Basic Healthcare Facility available in your area? Zahid hospital hub chauki
25. Are you happy with the healthcare facility? No
26. How often do you go there and for what reasons? Flu, Fever
27. Are medicines available at the facility? No

PUBLIC PERCEPTION ABOUT SAMBRIAL-KHARIAN HIGHWAY

SGS

Do you know about this project?	Yes ✓	No
Do you think, this project has Impacts?	Yes ✓	No
If yes, then EXPLAIN?		
Development of Area.		
Did you face any problem (Environmental/Social) with this ~~Highways~~ Projects		
If yes then What are your suggestions? No		
Suggestions:		

PUBLIC PERCEPTION ABOUT THIS PROPOSED PROJECT		
What are your perceived benefits from this project?		
Development of area.		
In your opinion, should this project be implemented here?	Yes ✓	No
Do you think that the project will affect your lifestyle?		
Yes		
What protective measures do you suggest during construction of proposed highway to safeguard your interests?		
Protective measures:		

SGS

Annexure VII

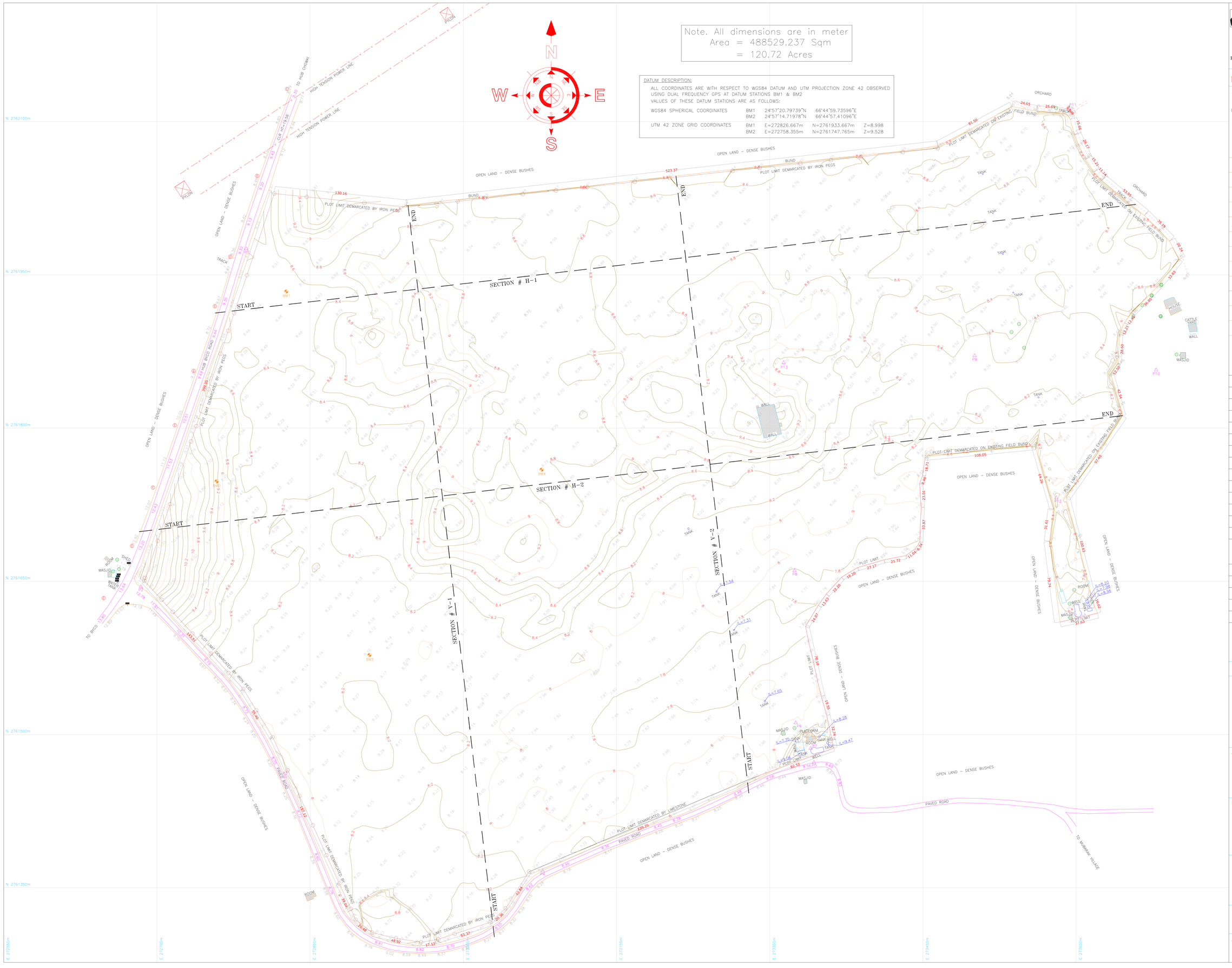
Project Area - Topographic Map

Note. All dimensions are in meter
Area = 488529.237 Sqm
= 120.72 Acres

DATUM DESCRIPTION:

ALL COORDINATES ARE WITH RESPECT TO WGS84 DATUM AND UTM PROJECTION ZONE 42 OBSERVED USING DUAL FREQUENCY GPS AT DATUM STATIONS BM1 & BM2
VALUES OF THESE DATUM STATIONS ARE AS FOLLOWS:

WGS84 SPHERICAL COORDINATES	BM1	24°57'20.79739"N	66°44'59.73596"E	
	BM2	24°57'14.71978"N	66°44'57.41096"E	
UTM 42 ZONE GRID COORDINATES	BM1	E=272826.667m	N=2761933.667m	Z=8.998
	BM2	E=272758.355m	N=2761747.765m	Z=9.528



SURVEY ENGINEERS

ENGINEERING SURVEY & MAPPING CONSULTANTS
SUITE # 5, 3RD FLOOR, PLOT # 19-C
SOUTH PARK AVENUE, PHASE-II, (EXT.)
DHA, KARACHI-75500
PH:- 021-35312400, FAX:- 021-35380636, CELL:- 0333-2233863
Email:- surveyengineers@gmail.com

Note. All dimensions are in meter

CONTOUR INTERVAL:-
MAJOR = 1.0m
MINOR = 0.2m

LEGEND:

- SURVEY CONTROL STATION
- BENCHMARK
- TREE
- PALM TREE
- ADVERTISING BOARD
- ELECTRIC POLE
- IRON PEG
- HIGH TENSION POWER LINE
- PAVED ROAD
- INVERT LEVEL — IL=8.20
- ROAD LEVEL — 8.58
- OUTER LEVEL — 8.20

COORDINATES OF SURVEY CONTROL STATIONS

STN.	EASTING	NORTHING	LEVEL
P1	272787.541	2761975.446	9.265
P2	272684.285	2761644.466	12.883
P3	272825.326	2761458.886	8.671
P4	273077.696	2761366.316	8.620
P5	273343.312	2761472.589	8.703
P6	273325.345	2761511.375	8.077
P7	273340.014	2761486.278	8.965
P8	273324.319	2761660.546	7.942
P9	273500.548	2761870.791	8.334
P10	273678.162	2761856.780	9.039
P11	273593.171	2762112.407	9.028
P12	273580.455	2761731.753	7.906
P13	273313.542	2761864.103	8.769

COORDINATES OF BENCHMARKS

BM.	EASTING	NORTHING	LEVEL
BM1	272826.667	2761933.667	8.998
BM2	272758.355	2761747.765	9.528
BM3	272908.094	2761577.712	8.528
BM4	273076.650	2761759.251	9.265

No.	Amendment.	By.	Date

Surveyed.	Faizan Kamil
Drawn.	Taha Sheikh
Checked.	Abid Shah
Approved.	
Date.	15 MAY 2019

Job Title.

TOPOGRAPHICAL & CONTOUR SURVEY

Drawing Title.

PREMIER MOTORS
HUB BYCO ROAD
BALOCHISTAN

Reference.

MR. IJAZ AHMED-SITE SERVICE MANAGER
M/S PREMIER MOTORS LIMITED
501, 5th FLOOR, BUSINESS PLAZA
MUMTAZ HASSAN ROAD KARACHI
PH: 021-32456494, CELL: 0333-2308697
Email: ijaz.ahmed@premier.com.pk

Scale.	Drawing Size.	Drawing No.
1 : 1200	A0	1

Job ID.	Computer Path.
PRM	D:\2019\PREMIER\

Annexure VIII

Geotechnical & Soil Study Report of Project Area

M/S PREMIER MOTORS LIMITED

R E P O R T
O N
GEOTECHNICAL INVESTIGATION
FOR
PREMIER MOTORS LIMITED
HUB, BALUCHISTAN

MAY, 2019

GEOTECHNICAL
SERVICES

Civil & Geotechnical Engineers
Testing Laboratory

52/3, DarulAman Society, Haider Ali Road,
Off Shaheed-e-Millat Road, Karachi.
Tele: (9221) 34532851 – 34535607
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R E P O R T
O N
GEOTECHNICAL INVESTIGATION
PREMIER MOTORS LIMITED
HUB, BALUCHISTAN

C O N T E N T S

R E P O R T
O N
GEOTECHNICAL INVESTIGATION
PREMIER MOTORS LIMITED
HUB, BALUCHISTAN

1. INTRODUCTION:

M/s Premier Motors Limited have planned to construct a factory building on at Hub, Baluchistan.

In order to obtain geotechnical information for the design of foundations, it was considered necessary to carry out subsoil investigation at the project site. `Geotechnical Services', were assigned the job of subsoil investigation. The report was prepared in May, 2019.

The program of investigation comprised of drilling fourteen boreholes, varying in depth from 10-15 m.

In order to ascertain the degree of compactness / consistency of substrata, standard penetration tests (SPTs) were performed at various depth horizons where found feasible.

Selected soil and water samples were sent to the laboratory of `Geotechnical Services' Karachi, for the evaluation of geo-engineering characteristics.

This report presents a review of subsoil investigation performed at the project site. The field and laboratory test data has been analysed for the evaluation of allowable bearing pressure. The recommendations regarding the type and bearing capacity of foundations are incorporated in the report.

2. PROGRAM OF INVESTIGATION:

Field Investigation:

The program of subsurface investigation at the project site consisted of drilling fourteen boreholes. The boring was accomplished by rotary method.

Following is the break-up of borehole depths and respective location:

Boring No.	Investigated Depth (m)	Elevation* (m)
BH-1	10	8.60
BH-2	15	8.80
BH-3	10	9.07
BH-4	15	8.17
BH-5	10	8.02
BH-6	15	8.11
BH-7	10	9.55
BH-8	10	8.19
BH-9	10	9.30
BH-10	10	7.89
BH-11	10	8.20
BH-12	10	8.58
BH-13	10	8.18
BH-14	10	9.30

* Ground elevations have been measured from topographic survey plan provided by the client.

The depths have been measured with respect to the existing ground level of the plot.

The locations of boreholes are shown in borehole location plan appended to this report.

Standard penetration tests (SPTs) were performed at various depth horizons where found feasible. This test was performed in accordance with ASTM Designation D-1586. This test gives indication of the degree of compactness/consistency of granular/cohesive substrata. The 'N'-values are shown on borelogs appended to this report.

Disturbed samples were obtained through split spoon sampler used in the standard penetration tests. These samples were carefully examined to identify the soil types at various depths. The samples were placed in plastic containers, marked with borehole number, depth and subsequently, dispatched to the laboratory.

Laboratory Testing:

In order to arrive at a rational evaluation of the geotechnical properties of the substrata, a program of laboratory testing was undertaken in the laboratory of Geotechnical Services. The testing was generally performed as per ASTM Standards.

Following physical and chemical tests were performed on representative soil and water samples:

- Grain size analysis
- Atterberg limits
- Moisture content
- Total salts
- Sulphate content
- Chloride content
- pH value

The results of laboratory tests are appended to this report.

Observations were regularly made in boreholes to determine the position of ground water table. The position of water table is indicated on the bore

3. SUBSURFACE CHARACTERISTICS:

In boreholes BH-1, BH-2, BH-3, BH-8, BH-12 & BH-14, top 2.0-5.0 m comprise of medium to dense SAND. This is underlain by very dense, sandy GRAVEL deposit that continues upto the investigated depth of 15.0m.

A study of remaining borelogs shows that at top 2.0-3.0 m there occurs a layer of very stiff to hard, clayey SILT. This is underlain by very dense, sandy GRAVEL deposit

Major subsurface deposits beneath the fill material can be described as follows:

a) Brown, medium to dense, silty, fine to medium SAND.

b) Brown, very stiff to hard, clayey SILT, trace to some sand

c) Brown, very dense, sandy GRAVEL with sandstone pieces

The exact sequence of occurrence of these deposits is shown on boreholes appended to this report.

Ground water table was encountered at a depth of about 9.0 m below existing ground level

4. FOUNDATION RECOMMENDATIONS:

4.1 General:

Foundation is a structural member that supports the loads of a structure and distributes them over the substrata on which it rests. In order to be satisfactory, the foundation should satisfy the following requirements:

a) The foundation must be safe against the possibility of shear failure

b) The foundation must not undergo excessive differential settlement

In addition to the above criteria, the foundation must be adequately designed in problematic soils such as expansive clays or shales, collapsible soils, sensitive soils, fill etc.

Calculations have been made to check allowable soil pressure for both the shear and settlement criteria.

4.2 Foundation Type:

The selection of foundation type depends upon the subsoil conditions, type of structure, and structural loads.

Taking into account the subsoil conditions and anticipated structural loads, it is therefore recommended that proposed structure be supported on isolated /combined footing placed at 1.50-2.00m depth below the existing ground level.

4.3 Allowable Bearing Capacity:

Allowable bearing capacity of **isolated/combined footing** placed at **1.50-2.00m** depth below existing ground level must be adopted as **2.00 tons/ft^2.**

In case structural loads are high, the structure may be supported on raft foundation placed at 2.00 m depth below the existing ground level.

Allowable bearing capacity of **raft foundation** placed at **1.50-2.00m** depth below existing ground level must be adopted as **2.50 tons/ft^2.**

It is important to note that before placing foundation concrete the excavations should be carefully inspected to ensure that footings are being placed in competent soil. This precaution is necessary to guard against localized fills and inhomogenities.

4.4 Modulus of Subgrade Reaction for Raft Foundation:

Modulus of subgrade reaction at 2.0 m depth may be adopted as 100 kcf.

4.5 Seismic Coefficients:

According to the Uniform Building Code (1997), the soil profile falls in 'S_C' category corresponding to 'very dense soil & soft rock'.

Following table gives seismic zone, seismic zone factor, soil profile type and seismic coefficients.

Seismic zone	**Zone factor 'z'**	**Soil profile Type**	**Seismic Coefficient 'Ca'**	**Seismic Coefficient 'Cv'**
2B	0.20	'S_C'	0.24	0.32

4.6 Cement Type:

American Concrete Institute (ACI) gives the requirements for concrete exposed to sulphate (SO_4) containing solutions. The ACI standards are given below:

Sulphate Exposure	**Water Soluble Sulphate in Soil (%)**	**Sulphate in Water (mg/lit)**	**Cement Type**
Negligible	0.00-0.10	0-150	OPC
Moderate	0.10-0.20	150-1500	Type II
Severe	0.20-2.00	1500-10000	Type V
Very Severe	Over 2.00	Over 10000	Type V plus pozzolan

Sulphate content in subsoil has was found to be negligible. It is therefore recommended that ordinary Portland cement be used in concrete in contact with soil.

……

For GEOTECHNICAL SERVICES

SAIF AHMED SAEED, P.E.
B.E. (Civil), M. Engg. (AIT)
AMASCE, MIE (Pak), Consult 882

A P P E N D I X

GEOTECHNICAL SERVICES

Bore Hole No BH-1
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.90 m

Elevation: 8.60 m

Type of Boring: Rotary

Date: 06.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N-blows /cm	REMARKS (m)
	SPT-1	SM	Brown, medium to dense, silty, fine to medium SAND		Dia = 100 mm	27	1
	SPT-2					43	2
3.0	SPT-3			5.60		50/5"	3
	DS	GP	Gray, very dense, sandy GRAVEL, trace silt				4
	DPT-1					50/3"	
	DS						5
	DPT-2					50/6"	6
	DS						7
	DPT-3					50/3"	
	DS						8
	DPT-4					50/3"	9
	DS						
10	DPT-5			-1.40		50/5"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-2
Sheet 1 of 2

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.90 m

Elevation: 8.80 m

Type of Boring: Rotary

Date: 07.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	SM	Brown, dense, fine SAND, little silt		Dia = 100 mm	35	1
2.0	SPT-2			6.80		50	2
	SPT-3	GP	Gray, very dense, sandy GRAVEL, trace silt			50/6"	3
	DS						
	DPT-1						4
						50/4"	
	DS						5
	DPT-2						
						50/6"	6
	DS						
	DPT-3						7
						50/5"	
	DS						8
	DPT-4						
						50/8"	9
	DS						
10							10

GEOTECHNICAL SERVICES

Bore Hole No BH-2
Sheet 2 of 2

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.90 m

Elevation: 8.80 m

Type of Boring: Rotary

Date: 07.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N-blows /cm	REMARKS (m)
	DPT-5	GP	Gray, very dense, sandy GRAVEL, trace silt			50/6"	
	DS						11
	DPT-6					50/6"	12
	DS						13
	DPT-7					50/6"	
	DS						14
15	DPT-8			-6.20		50/5"	15
			BOTTOM OF BOREHOLE				

GEOTECHNICAL SERVICES

Bore Hole No BH-3
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.90 m

Elevation: 9.07 m

Type of Boring: Rotary

Date: 09.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	SM	Brown, medium dense, fine SAND, little silt		Dia = 100 mm	25	1
2.0	SPT-2			7.07		32	2
		SM	Brown, dense, silty, fine to medium, SAND				
3.0	SPT-3			6.07		50/7"	3
	DS	GP	Gray, very dense, sandy GRAVEL, trace silt				4
	DPT-1					50/4"	
	DS						5
	DPT-2					50/5"	6
	DS						7
	DPT-3					50/3"	
	DS						8
	DPT-4					50/3"	9
	DS						
10	DPT-5			-0.93		50/5"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-4
Sheet 1 of 2

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.75 m

Elevation: 8.17 m

Type of Boring: Rotary

Date: 05.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	ML	Brown, very stiff, clayey SILT, trace sand		Dia = 100 mm	30	1
2.0	SPT-2			6.17		39	2
		SM	Brown, dense to very dense, silty, fine to medium SAND				
3.2	SPT-3			4.97		50/6"	3
	DS	GP	Gray, very dense, sandy GRAVEL, trace silt				
	DPT-1						4
						50/5"	
	DS						5
	DPT-2						
						50/5"	6
	DS						
	DPT-3						7
						50/3"	
	DS						8
	DPT-4						
						50/3"	9
	DS						
10							10

GEOTECHNICAL SERVICES

Bore Hole No BH-4
Sheet 2 of 2

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.75 m

Elevation: 8.17 m

Type of Boring: Rotary

Date: 05.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	DPT-5					30	
	DS						11
	DPT-6					39	12
	DS	GP	Gray, very dense, sandy GRAVEL, trace silt				13
	DPT-7					50/6"	
	DS						14
15	DPT-8			-6.83		50/5"	15
			BOTTOM OF BOREHOLE				

GEOTECHNICAL SERVICES

Bore Hole No BH-5
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.60 m

Elevation: 8.02 m

Type of Boring: Rotary

Date: 07.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	ML	Brown, very stiff, clayey SILT, trace sand		Dia = 100 mm	18	1
2.0	SPT-2			6.02		41	2
	SPT-3	ML	Brown, hard, clayey SILT, with interlayer of sand			50/5"	3
4.5	SPT-4			3.52		22	4
		SM-ML	Brown, medium dense, silty SAND / sandy SILT				5
6.0	SPT-5			2.02		50/6"	6
	DS	GP	Gray, very dense, sandy GRAVEL, trace silt				7
	DPT-3					50/3"	
	DS						8
	DPT-4					50/2"	9
	DS						
10	DPT-5			-1.98		50/2"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-6
Sheet 1 of 2

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.70 m

Elevation: 8.11 m

Type of Boring: Rotary

Date: 08.05.19 o 09.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N-blows /cm	REMARKS (m)
	SPT-1	CL	Brown, medium dense, sandy SILT, trace clay		Dia = 100 mm	22	1
2.0	SPT-2			6.11		33	2
	SPT-3	SM	Brown, medium to dense, silty, fine to medium SAND			38	3
	DS						
	SPT-4						4
	DS					24	
5.0				3.11			5
	DPT-1	GP	Gray, very dense, sandy GRAVEL, trace silt				
	DS					50/7"	6
	DPT-2						7
	DS					50/7"	
							8
	DPT-3						
	DS					50/5"	9
10							10

GEOTECHNICAL SERVICES

Bore Hole No BH-6
Sheet 2 of 2

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.70 m

Elevation: 8.11 m

Type of Boring: Rotary

Date: 08.05.19 o 09.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	DPT-4					50/7"	
	DS						11
	DPT-5					50/5"	12
	DS	GP	Gray, very dense, sandy GRAVEL, trace silt				13
	DPT-6					50/7"	
	DS						14
15	DPT-7			-6.89		50/5"	15
			BOTTOM OF BOREHOLE				

GEOTECHNICAL SERVICES

Bore Hole No BH-7
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.80 m

Elevation: 9.55 m

Type of Boring: Rotary

Date: 08.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	CL	Brown, medium dense, sandy SILT with some clay		Dia = 100 mm	30	1
2.0	SPT-2			7.55		33	2
		CL-ML	Brown, hard, silty CLAY / clayey SILT, some sand				
3.0	SPT-3			6.55		50/6"	3
	DS	GP	Gray, very dense, sandy GRAVEL, trace silt				4
	DPT-1					50/4"	
	DS						5
	DPT-2					50/3"	6
	DS						7
	DPT-3					50/4"	
	DS						8
	DPT-4					50/3"	9
	DS						
10	DPT-5			-0.45		50/3"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-8
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.80 m

Elevation: 8.19 m

Type of Boring: Rotary

Date: 08.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	SM	Brown, medium to dense, silty, fine SAND		Dia = 100 mm	26	1
	SPT-2					29	2
	SPT-3					37	3
3.5				4.69			
	DS	GP	Gray, very dense, sandy GRAVEL, some silt				4
	DPT-1					50/7"	
	DS						5
	DPT-2					50/4"	6
	DS						7
	DPT-3					50/3"	
	DS						8
	DPT-4					50/3"	9
	DS						
10	DPT-5			-1.81		50/3"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-9
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.80 m

Elevation: 9.30 m

Type of Boring: Rotary

Date: 10.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	SM	Brown, medium to dense, silty, fine SAND		Dia = 100 mm	21	1
	SPT-2					34	2
	SPT-3					40	3
3.5				5.80			
	SPT-4	SP	Gray, very dense, gravelly, coarse SAND			50/7"	4
	DS						5
	DPT-1					50/4"	6
	DS						7
	DPT-2					50/3"	
	DS						8
	DPT-3					50/3"	9
	DS						
10	DPT-4			-0.70		50/3"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-10
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 9.0 m

Elevation: 7.89 m

Type of Boring: Rotary

Date: 10.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	CL-ML	Brown, very stiff, silty CLAY / clayey SILT, trace sand		Dia = 100 mm	22	1
	SPT-2					30	2
2.5				5.39			
	SPT-3	CL-ML	Brown, hard, silty CLAY / clayey SILT, trace sand			55/4"	3
3.5				4.39			
	DS	GP	Gray, very dense, sandy GRAVEL, some silt				4
	DPT-1					50/3"	
	DS						5
	DPT-2					50/4"	6
	DS						7
	DPT-3					50/3"	
	DS						8
	DPT-4					50/5"	9
	DS						
10	DPT-5			-2.11		50/3"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-11
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.90 m

Elevation: 8.20 m

Type of Boring: Rotary

Date: 10.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	CL-ML	Brown, hard, silty CLAY / clayey SILT, trace sand		Dia = 100 mm	32	1
	SPT-2					32	2
	SPT-3					34	3
	SPT-4					50/5"	4
5.0	DS			3.20			5
	DPT-1	GP	Gray, very dense, sandy GRAVEL, some silt			50/3"	6
	DS						7
	DPT-2					50/2"	
	DS						8
	DPT-3					50/3"	9
	DS						
10	DPT-4			-1.80		50/3"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-12
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 9.00 m

Elevation: 8.58 m

Type of Boring: Rotary

Date: 05.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	SC	Brown, dense, clayey SAND		Dia = 100 mm	31	1
	SPT-2					34	2
	SPT-3					34	3
	SPT-4					41	4
5.0	DS			3.58			5
	DPT-1	GP	Gray, very dense, sandy GRAVEL, with sandstone pieces			50/6"	6
	DS						7
	DPT-2					50/3"	
	DS						8
	DPT-3					50/3"	9
	DS						
10	DPT-4			-1.42		50/5"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-13
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.18 m

Elevation: 8.18 m

Type of Boring: Rotary

Date: 06.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	ML	Brown, medium dense, sandy SILT		Dia = 100 mm	26	1
2.0	SPT-2			6.18		27	2
		ML	Brown, very stiff, clayey SILT, trace sand				
3.0	SPT-3			5.18		50	3
							4
	SPT-4	SM-ML	Brown, medium to dense, silty SAND / sandy SILT, little clay			29	
							5
6.0	SPT-5			2.18		50/2"	6
	DS						7
	DPT-1					50/5"	
	DS	GP	Gray, very dense, sandy GRAVEL, trace silt				8
	DPT-2					50/5"	9
	DS						
10	DPT-3			-1.82		50/5"	10

BOTTOM OF BOREHOLE

GEOTECHNICAL SERVICES

Bore Hole No BH-14
Sheet 1 of 1

SUBSURFACE EXPLORATION LOG

Client: Premier Motors Limited, Hub, Balochistan

Ground Water Depth: 8.90 m

Elevation: 9.30 m

Type of Boring: Rotary

Date: 04.05.19

Depth (m)	Sample No.	CLASSIFICATION	STRATUM DESCRIPTION	Elevation (m)	Dia of Casing /Hole	SPT N -blows /cm	REMARKS (m)
	SPT-1	SM	Brown, medium to dense, silty, fine to medium SAND		Dia = 100 mm	22	1
	SPT-2					26	2
	SPT-3					23	3
							4
	SPT-4					47	
5.0				4.30			5
	DS	GP	Gray, very dense, sandy GRAVEL, trace silt				
	DPT-1					50/2"	6
	DS						7
	DPT-2					50/3"	
	DS						8
9.0	DPT-3			0.30		50/3"	9
10	SPT-5			-0.70		50/2"	10

BOTTOM OF BOREHOLE

PROJECT : PREMIER MOTORS LIMITED, HUB, BALUCHISTAN

DATE: May 18, 2019.
L.R. No.: 302/19
SHEET 1 OF 2

GRAIN SIZE ANALYSIS (PER CENT FINER BY WEIGHT) **HYDROMETER**
SIEVE SIZES IN mm **(DIA IN mm)**

S No	BH NO.	SAMPLE	DEPTH (m)	75.0	37.5	19.0	9.50	4.75	2.36	1.18	0.600	0.300	0.150	0.075	.05	.01	.002	.001
1.	BH-1	SPT-1	1.00	-	-	-	-	-	100	99	96	74	61	38	-	-	-	-
2.	BH-1	SPT-3	3.00	-	-	100	97	84	74	67	61	41	33	22	-	-	-	-
3.	BH-1	DS	6.00-7.50	-	100	50	43	29	14	11	10	08	07	06	-	-	-	-
4.	BH-2	SPT-2	2.00	-	-	-	-	100	99	98	95	61	43	17	-	-	-	-
5.	BH-2	DS	4.50-6.00	100	70	26	01	-	-	-	-	-	-	-	-	-	-	-
6.	BH-3	SPT-1	1.00	-	-	-	-	-	100	99	97	78	67	19	-	-	-	-
7.	BH-3	SPT-2	2.00	-	-	-	-	100	99	98	97	85	71	43	34	18	09	02
8.	BH-3	DS	4.50-6.00	-	100	15	01	-	-	-	-	-	-	-	-	-	-	-
9.	BH-4	SPT-1	1.00	-	-	-	-	-	-	100	99	97	95	92	80	56	26	12
10.	BH-4	SPT-3	3.00	-	-	-	-	-	100	99	95	71	58	44	38	22	16	08
11.	BH-4	DS	7.50-9.00	100	78	19	14	12	09	07	06	05	04	03	-	-	-	-
12.	BH-4	DS	13.50-15.00	100	65	04	01	-	-	-	-	-	-	-	-	-	-	-
13.	BH-5	SPT-2	2.00	-	-	-	-	-	100	99	98	97	96	93	80	61	28	13
14.	BH-5	SPT-3	4.50	-	-	-	-	-	-	100	97	79	70	50	42	29	18	10
15.	BH-5	DS	6.00	-	100	51	13	02	-	-	-	-	-	-	-	-	-	-
16.	BH-6	SPT-1	1.00	-	-	-	-	-	-	100	99	86	74	60	54	38	18	10
17.	BH-6	SPT-6	2.00	-	-	-	-	-	-	100	99	79	67	45	36	21	10	02
18.	BH-6	DS	4.95-6.00	-	100	64	04	-	-	-	-	-	-	-	-	-	-	-
19.	BH-7	SPT-2	2.00	-	-	-	-	100	99	95	92	85	80	70	60	44	24	12
20.	BH-7	DS	6.00-7.50	100	44	16	01	-	-	-	-	-	-	-	-	-	-	-

……cont'd

PROJECT : PREMIER MOTORS LIMITED, HUB, BALUCHISTAN

DATE: May 18, 2019.
L.R. No.: 302/19
SHEET 2 OF 2

GRAIN SIZE ANALYSIS (PER CENT FINER BY WEIGHT) **HYDROMETER**
SIEVE SIZES IN mm **(DIA IN mm)**

S No	BH NO.	SAMPLE	DEPTH (m)	75.0	37.5	19.0	9.50	4.75	2.36	1.18	0.600	0.300	0.150	0.075	.05	.01	.002	.001
21.	BH-8	SPT-2	2.00	-	-	-	-	-	-	100	98	82	67	34	-	-	-	-
22.	BH-8	DS	6.00-7.50	-	100	57	39	38	37	36	35	22	19	14	-	-	-	-
23.	BH-9	SPT-2	2.00	-	-	-	-	-	-	100	99	86	71	44	38	19	09	02
24.	BH-9	SPT-4	4.50	-	100	85	82	81	74	68	59	31	26	21	-	-	-	-
25.	BH-10	SPT-1	1.00	-	-	-	-	-	-	-	-	100	99	96	82	58	26	12
26.	BH-10	SPT-3	3.00	-	-	-	-	-	-	-	100	99	98	97	85	60	28	13
27.	BH-10	DS	7.50-9.00	-	100	55	01	-	-	-	-	-	-	-	-	-	-	-
28.	BH-11	SPT-1	1.00	-	-	-	-	-	-	-	-	100	99	98	86	59	27	13
29.	BH-11	SPT-4	4.50	-	-	-	-	-	-	-	100	99	98	97	87	60	58	13
30.	BH-11	DS	7.50-9.00	-	100	49	01	-	-	-	-	-	-	-	-	-	-	-
31.	BH-12	SPT-1	1.00	-	-	-	-	-	100	99	96	76	83	43	37	21	17	08
32.	BH-12	DS	4.95-6.00	100	77	45	25	22	19	16	14	09	07	06	-	-	-	-
33.	BH-13	SPT-2	2.00	-	-	-	-	-	-	100	99	97	96	94	80	58	28	13
34.	BH-13	SPT-4	4.50	-	-	-	-	-	-	100	97	77	68	51	41	25	12	04
35.	BH-13	DS	7.50-9.00	-	100	16	01	-	-	-	-	-	-	-	-	-	-	-
36.	BH-14	SPT-2	2.00	-	-	-	-	-	-	100	93	89	72	39	-	-	-	-
37.	BH-14	DS	4.95-6.00	-	100	46	02	-	-	-	-	-	-	-	-	-	-	-
38.	BH-14	DS	9.00-10.00	-	100	84	74	70	69	67	67	66	64	56	50	38	21	10

PROJECT : PREMIER MOTORS LIMITED, HUB, BALUCHISTAN

DATE: May 18, 2019.
L.R. No.: 302/19

ATTERBERG LIMITS / MOISTURE CONTENT

S. NO.	BORING NO.	SAMPLE	DEPTH (m)	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
1.	BH-1	SPT-1	1.00	NON-PLASTIC	NON-PLASTIC	9.61
2.	BH-2	SPT-2	2.00	NON-PLASTIC	NON-PLASTIC	12.16
3.	BH-3	SPT-1	1.00	15	04	13.82
4.	BH-3	SPT-2	2.00	NON-PLASTIC	NON-PLASTIC	6.14
5.	BH-4	SPT-1	1.00	23	06	11.46
6.	BH-4	SPT-3	3.00	15	03	11.49
7.	BH-5	SPT-2	2.00	28	08	12.10
8.	BH-5	SPT-4	4.50	18	04	11.04
9.	BH-6	SPT-1	1.00	17	04	4.56
10.	BH-7	SPT-2	2.00	24	06	6.23
11.	BH-9	SPT-2	2.00	NON-PLASTIC	NON-PLASTIC	7.46
12.	BH-9	SPT-4	4.50	NON-PLASTIC	NON-PLASTIC	7.35
13.	BH-10	SPT-1	1.00	24	06	5.08
14.	BH-10	SPT-3	3.00	29	09	14.74
15.	BH-11	SPT-1	1.00	26	08	8.44
16.	BH-11	SPT-4	4.50	28	09	18.65
17.	BH-12	SPT-1	1.00	15	03	8.28
18.	BH-13	SPT-2	2.00	26	07	23.91
19.	BH-13	SPT-4	4.50	16	03	6.21
20.	BH-14	SPT-2	2.00	NON-PLASTIC	NON-PLASTIC	10.14
21.	BH-14	DS	9.00-10.00	20	04	10.08

PROJECT : PREMIER MOTORS LIMITED, HUB, BALUCHISTAN

DATE: May 18, 2019.
L.R. No.: 302/19

CHEMICAL TESTS ON SOIL

S. NO.	BORING NO.	SAMPLE	DEPTH (m)	SULPHATE CONTENT (%)
1.	BH-1	SPT-1	1.00	0.054
2.	BH-4	SPT-1	1.00	0.064
3.	BH-5	SPT-1	1.00	0.088
4.	BH-7	SPT-1	1.00	0.048
5.	BH-12	SPT-1	1.00	0.052

PROJECT : PREMIER MOTORS LIMITED, HUB, BALUCHISTAN

DATE: May 18, 2019.
L.R. No.: 302/19

CHEMICAL TESTS ON WATER

S. NO.	BORING NO.	TOTAL DISSOLVED SALTS (mg/lit)	SULPHATE CONTENT (mg/lit)	CHLORIDE CONTENT (mg/lit)	pH VALUE
1.	BH-2	8400	349	3300	7.70
2.	BH-3	8800	338	3500	7.70
3.	BH-5	9000	329	3600	7.70
4.	BH-7	8400	311	3310	7.70
5.	BH-11	9800	349	3800	7.70
6.	BH-12	8800	320	3500	7.70
7.	BH-14	13800	369	5500	7.75