FIVE ▶

SUSTAINABLE ENVIRONMENTAL POLICY

POLICY NUMBER – ENG 007 **DATE:** 01.01.2023

ISSUED BY	PROCESS OWNER	APPROVED BY
Engineering Manager	Director of Engineering, Project Team	Board

PURPOSE AND OBJECTIVE

FIVE endeavors to operate its business in an environmentally responsible manner in accordance with highest international standards. The current activities of the company involve owning and operating luxury hospitality properties and residential buildings. The organization is also investing and developing new luxury hospitality and residential projects.

The organization's commitment to environment is demonstrated through the implementation of the Integrated Management System policy, adopting, and promoting practices that are focused on the continual improvement of the environmental performance and is consistent with the applicable environmental regulations and international best practices.

FIVE is committed to minimize impact on environment through Efficient Energy, Water, Transportation and Waste management and follow best environmental practices across entire operations.

APPLICABILITY

This policy covers all properties of FIVE (including under and new construction properties) and associated activities. This document discusses associated environmental aspect and impacts, and, recommends measures to be adopted to mitigate any adverse impacts of projects operated by FIVE. The measures under this policy are also applicable to all suppliers of FIVE to adhere to environmental supplier standards.

CONTENTS

1. SCOPE

The sustainable environmental policy illustrates the following scope of work on environmental standards in construction:

1.1 Waste

FIVE has developed a separate Waste Management Policy that details the management strategy to implement a reduce, reuse, and recycle process for the waste generated at site with guidelines for management, storage and disposal of different types hazardous and non-hazardous waste generated during the project construction and operation period.

1.2 Non-Hazardous Wastes

Predicted sources of construction waste generations, types, and quantities indicated below were based on the project scope and planned construction work.

1.3 Non-Hazardous Solid Wastes

Construction-related activities that are expected to act as potential sources for non-hazardous solid waste generation include the following:

- Excavated soil and topsoil
- Aggregates (concrete, bricks, stone, etc.);
- Off-specification raw materials (contaminated, expired or outdated);
- Off-specification spoiled products unfit for use or consumption (e.g., prefabricated materials which are not of required dimensions or damaged materials);
- Machinery/ equipment/ vehicle maintenance waste including spare parts, tires, and coolants;
- Solid off-cuts, trimmings and excess materials;
- Packaging materials;
- Paper wastes;
- Glass
- Plastic Cardboard
- Gypsum

- Domestic wastes (i.e., organic waste or municipal waste).

1.4 Non-Hazardous Liquid Waste

Non-hazardous liquid wastes may include the following:

- Sewage/black water (effluent from bathrooms)
- Grey water (effluent from lavatories / washing facilities)
- Wash water from onsite concrete mixers (where onsite concrete mixing will occur)
- Water resulting from Hydro-testing activities (namely for irrigation, storm water, firefighting, and sewerage pipes)
- Dewatered water
- Condensate water
- Blow down water
- Cooking Oil
- Fat/Grease

1.5 Hazardous Solid Wastes

- Contaminated soil and materials (mixed with oil or other liquid materials via accidental spillages/ leakages or spill/ leak clean-up);
- Undesirable by-products from maintenance activities (soiled/oily rags, used PPEs, etc.)
- Used/ empty containers of paint, solvents, acid or other chemicals;
- Wastes of electrical and electronic equipment that includes: toners, cartridges, batteries, computer/ laptop accessories, discarded mobile phones, etc.;
- Electric wastes (light bulbs, tubes);
- Asbestos waste if detected;
- Fuel / oil residues from storage facilities;

1.6 Hazardous Liquid Waste

Hazardous liquid wastes produced may include, among others:

- Hydrocarbon- and Petroleum-based wastes (e.g., spent oils, fuels, grease, paints, solvents);
- Oils or chemicals collected from spillovers or leaks; and
- Quantity of hazardous liquid waste generated from construction activities is anticipated to be limited, compared to non-hazardous liquid wastes.

2. Environmental Permits

Construction activities will be undertaken in accordance with all statutory and other obligations including key legislation and policies, approvals, licenses and agreements. All licenses, permits and approvals will be obtained and maintained as required throughout the life of the project and a copy of the permit and all relevant environmental approvals will be available on the project site at all times.

The Project Environmental Specialist will be responsible for informing the project management regarding environmental permit requirements and renewal of all licenses, approvals and permits.

For Dubai based projects an Environmental Clearance (EC) or No Objection Certificate (NOC) is a legal requirement issued by Dubai Municipality – Environmental Planning and Studies Section (DM-EPSS) in accordance with Federal Law No. 24 and its Environmental Regulations. For other locations FIVE will comply with all similar laws in the country of operation.
All construction team working in site for FIVE are required to maintain licenses, permits and other required legal documents to comply with government rules and regulations.
FIVE performs a periodic review yearly for new laws or updates to existing laws to identify any further applicable laws and regulations with regards to environmental measures.

3. Environmental Management

This section summarizes the environmental management systems adopted for any project to ensure that environmental planning, operation and control activities of the project are systematically and robustly managed. It is also applicable in managing identified environmental impacts in compliance with applicable regulations and guidelines.

4. Environmental Policy

FIVE maintains the accreditation of ISO 14001:2015 – Environmental Management System. In addition, FIVE is following the Safety, Health, Environment and Quality (SHEQ) Policy which details the group's commitments and best endeavors to manage effectively the environmental risks across the business.
The policy will be followed and implemented throughout the project by the project team, by appointed contractors and other people who worked on site by targeting the main objectives mentioned in the policy. This policy also further applies to all operational projects.

5. Environmental Inspections and Audit

5.1 Site Inspection

An environment specialist/HSE representative from FIVE will carry out an informal daily site environmental inspections to ensure the compliance with this Policy.

Daily/ Monthly tours is intended to observe employees' activities and visually assess onsite implementation of control measures. Environment Specialist and/or HSE staff is responsible for such tours and provide verbal instructions in case any observation or violation is observed. Any major observations resulting from such tours will be recorded and communicated. Close out evidences (e.g., Photographs) of the findings must be attached in close out report as proof of corrective actions taken for the non-conformances observed.

Formal site tours shall be carried out on a weekly basis. This weekly tour will be a joint tour. Environmental inspection records will be submitted to Management on a weekly basis and readily made available for audit on the duration of the project and upon request.

5.2 Audits

FIVE will conduct internal audits of its compliance with all the record keeping requirements, environmental systems and procedures contained within this Policy. These audits will be carried out every six (6) months. The objective of these audits is to confirm that all incidents and non-conformances are being managed correctly, procedures are being followed, and actions are completed.

Corrective actions must be recommended, with responsibility and timeframes for completion of action assigned where non-conforming conditions exist. FIVE Environment Specialist /HSE representative must track the completion of the corrective actions.

All audit documentation will be maintained on file and will be made available for the duration of the contract.

The final Environmental Completion Audit Report and the associated close out report developed by FIVE and will be included in Close out documents of the project.

5.3 Regulatory Inspections

An authorized representative of Government who's carrying out inspections, incident investigations, taking pictures and obtaining relevant information of the sources of emission or waste and waste discharges will be allowed and assisted at site at any time, except if it is unsafe to do so.

5.4 Incident Reports

In the event of an environmental incident resulted from the activities performing by the work team, the incident will be reported to the Environment Specialist /HSE Representative and the Project or Facilities Manager who will then conduct initial investigation and will be reported to higher management

Types of environmental incidents are provided below:

Incident Type	Details
Spillages	Significant or major Oil / Fuel / Chemical release resulting in significant soil or groundwater pollution
Nuisance/ Emissions	• Release of excessive Dust/ Bulk Powders • Leakage of gaseous substance/ air pollution

Incident Type	Details
(Noise, Dust, Vibration, Odour, etc.)	• Generation of excessive noise • Any letters/correspondence received from authorities or 3rd parties in relation to nuisance or complaints
Discharges	• Any visible oil/ chemicals/ wastewater discharged offsite as a result of programme activities. • Discharging to a receiving ground, water body or drains without discharge approval/permit from Regulator. • Any breaches of discharge permits/ parameters
Ecology	• Damage to any notable species of plant, or animal (or their habitat)
Others	• Any other incident leading to damage to the environment, breach of regulation etc.

FIVE supports the above commitment by taking the following actions:

- To comply fully with all applicable legislations. Meet or exceed all the environmental legislation that relates to its operation.
- Minimize our waste by reviewing the purchasing practices and segregate waste to reduce, reuse and recycle the resources consumed by the business wherever possible.
- To implement training for all employees and communicate with suppliers, gust to raise awareness about policies and minimize carbon footprint.
- To implement energy, water and resource conservation programs through innovation and applying best practices.
- To reduce Green House Gas emission from transportation and minimizing waste generation.
- To establish targets to measure the continuous improvement in its environmental performance.
- To monitor and review our environmental performance on regular basis for achieving our objective and targets.
- To ensure that dust generation during construction process is minimized through control measures such as water spraying, covering of loose soil or steep slope and vehicle wheel washing facility.
- During any fit out works the indoor contaminants are controlled and does not affect other occupied area of the building causing discomfort to occupants.
- All chemicals, oil and hazardous materials are stored safely on hard surface with bund wall so that any spillage of hazardous material does not impact environment and underground aquifers. Any indoor storage spaces for janitorial chemicals are adequately ventilated by direct extraction system.
- No hazardous material such as mercury, PCB are used at site.
- Any discharge of rainwater is responsibly managed and wherever possible are reused at site and top soil is protected from erosion.
- Noise level from any construction activities meet local municipal codes for daytime activities and nighttime activities.
- No invasive plants are used for landscaping and prioritizing natural-based pesticides and chemicals for the landscape maintenance.
- In cold climate it will consider salt free and environmentally preferred deicers for snow and ice removal.
- To provide a framework for compliance with environmental management requirements.
- To fully comply with the legislative and other Government requirements and regulations;
- To provide details of environmental monitoring as per relevant contract specification and SOP.

- Establish environmental management related roles and responsibilities of key personnel
- To provide a mechanism to apply environmental mitigation measures including the implementation of environmental control in relation to air, noise, water and waste management.
- To ensure a monitoring regime to check the adequacy of controls as they are implemented during construction.
- To effectively communicate the environmental plan and requirements to all staff during staff training, toolbox talk and employee's orientation program.
- Ensure that each business function successfully contributes to achieve the business project environmental and sustainability Key Performance Indicators (KPIs)
- To protecting the environment actively Employees, participate in environment awareness program such as beach cleaning
- Comply with UAE Law No. (24) Of 1999 - Protection and Development of the Environment. It includes 101 Articles that concentrate on different environmental issues mainly the development of the environment, protection of water, air and land from pollution, handling hazardous substances, development of protected areas and the protection of the marine environment.
    - Law No. (23) of 1999 - Protection and Development of the Marine Environment
    - Law No. (32) of 1982 - Wildlife Protection
    - Law No. (41) 192 - Pesticides use and permits required
    - Dubai Municipality Environmental Technical Guidelines

6. Environmental Commitments Objectives and Targets

As a part of FIVE's ISO 14001 standard implementation and a thorough assessment of our environment and sustainability framework, FIVE's sustainable environmental policy draws on the Objectives, Targets and Action Plans as outlined by the dynamic 14001 Environmental Management Plan. These address broad level targets and mitigation measures on environment management covering aspects on Carbon Emissions, Energy, Water, Waste, Biodiversity and Procurement. FIVE monitors its progress against these targets on a quarterly basis.

International Protocol and Conventions

FIVE strives to adhere h several International Conventions which include the below.

Aspect	Agreement / Convention
Desertification	United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (Decree No. 29 of 1999) (UNCCD, 2007)
Biodiversity / Natural Heritage	United Nations, Convention on Biological Diversity. 1992 (Emiri Decree No. 90 of 1996)
	Agenda 21 Convention on the Conservation of Wildlife and Natural Habitats in the Countries of the Gulf Cooperation Council (Decree No. 43 of 2003)
	Convention concerning the Protection of World Cultural and Natural Heritage (Decree No. 21 of 1985)
	The Convention on International Trade in Endangered Species (CITES) (Law No. (5) of 2006 concerning regulation of trade in endangered species of wild fauna and flora and their products) (2012)

Aspect	Agreement / Convention
Ozone Layer	Vienna Convention for the Protection of the Ozone Layer, 1985, and Montreal Protocol on Substances that Deplete the Ozone Layer, 1985 and its annexes, 1990 and 1992 (Decree No. 23 of 1999)
Climate Change	Treaty for climate Change, Stockholm 1992
	UN Framework Convention on Climate Change, 1996
	Kyoto Protocol to the Framework Convention on Climate Change, 1997 (Signatory in 2005)
	United Nations Framework Convention on Climate Change (Decree No. 47 of 1996)

7. Environmental toolbox talks

A weekly environmental toolbox talk will be implemented to communicate any potential environmental hazards, risks and impacts associated with specific project activities. These talks will also explain the environmental issues and mitigation measures to be undertaken by each work party based on their construction activities. Topics likely to be covered will include:

- Incidents observed onsite and response procedures
- Non-hazardous waste management
- Site supervision and management
- Hazardous waste management
- Use of spill prevention and clean-up kits,
- Preventing soil and groundwater contamination
- Concrete waste management
- Sewer and waterways contamination control
- Air pollution control
- Noise pollution control
- Archaeological, cultural heritage chance find procedure
- Control of Substances Hazardous to Health
- Changes to the CEMP, as applicable

These TBT's will be delivered in the native languages of the work team to ensure that each member understands the environmental issues. A record of the TBT will be kept at the Project site for inspection purposes. The Construction Manager will ensure that this activity is implemented by their subordinates on a week basis.

Training plan

During the Main Construction Works Contract, all staff will receive inductions covering relevant Project environmental requirements prior to the commencement of their work. Training programme will include formal induction programmes and toolbox talks. Development of training programs, training material and its delivery by the contractor shall be done in the light of trainee's ease to understand common languages e.g. English, Arabic, Hindi, Urdu, German etc. As a minimum, training modules will include:

- Explanation of the importance of compliance with the CEMP.
- Discussion on the construction work activities interacting with the environment and potential environmental impacts that may arise from them.
- Explanation of the roles and responsibilities of individuals responsible for matters pertaining to the CEMP, especially for emergency preparedness and response.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.

The training programme will be developed and implemented for the following staff:

- All staffs and its sub-contractors
- Discipline Leads (Supervisor's/ foreman's etc.)
- Drivers and operators of any type of tools, equipment, machinery and vehicles engaged for main construction works
- Emergency response teams

All project office staffs including but not limited to management staff and their subordinates of all levels.

Table below provides a list of topics for environmental awareness internal trainings, which will be elaborated during the course of the Main Construction Works Contract. The Training will be conducted once a month every first Saturday of the month and additional session will be conducted depending on the needs observed on site and for management staff training will be incorporated during the weekly staff meeting. Training material shall be of an international standard. Potential sources of information for the preparation of training material are:

- United States Environmental Protection Agency: http://www2.epa.gov/learn-issues
- Network Registration: http://www.netregs.org.uk/business_sectors/construction/all_guidance.aspx
- Construction Industry Research and Information Association: www.ciria.org
- http://www.hse.gov.uk/

List of topics for Environmental Awareness Trainings

Environmental Policy	Noise and Vibration	Emergency preparedness and response, Important personnel and contacts
Environmental sensitivities, Key Environmental issues and applicable Chance find Procedures	Use of water	Incident Reporting Procedures
Applicable environmental legislation, standards and permitting requirements	Chemicals and Hazardous Materials	Rehabilitation/restoration requirements
Air quality, dust control measures, Maintenance of vehicles, equipment and machinery	Hazardous and non-hazardous Waste Management	Environmental Inspections and Audits
Groundwater Quality Management	Use of PPE	Soil and spoil
Implementing environmental controls	Biodiversity and Urban Ecology and Chance find procedures	Traffic Management, Road safety and restrictions, defensive driving
Dewatering	Micro-tunnelling and Slurry Lagoon	Energy Conservation
Water Conservation	Office Sustainability	

Environmental training frequency

Training	Trainee	Trainers	Frequency
Environmental Induction as part of HSE induction	New starters/Visitors	HSE officer	Upon arrival at site
Environmental Awareness Trainings (Refer to topics provided in Table 9	Site staff of all levels	Environmental Manager Environmental Officer	Monthly
START briefing	All worker teams (including sub-contractors)	HSE Officer/ Supervisors/ Foreman	Daily, before start of work or shift
ToolBox talks	All worker teams (including sub-contractors)	Environmental Manager Environmental Officer Safety Officer Supervisors Foreman	Weekly

8. Roles and Responsibilities

Project Manager

The Project Manager or Facilities Manager holds ultimate responsibility to ensure that the environmental requirements of this project, which includes those of the Authorities are met. Copies of the policy are circulated to various personnel as per the distribution matrix.

HSE / Environmental Officer:

- Aid the Environmental Representative to ensure environmental compliance with best practice guidelines, legislative requirement, corporate standards, and client requirements
- Carry out environmental inspections of the project and liaise with staff and contractors to achieve timely improvements
- Raise awareness of environmental issues through an on-site presence and establishing relationships with staff and contractors
- Assist the development and implementation of the project environmental plan
- Track site environmental performance indicators over time and report to site management
- Help to undertake and prepare environmental incident reports, to present to site management
- Ensure compliance with the project waste management plan
- Undertake regular inspections of all waste compounds
- Liaise with staff and contractors regarding any waste management issues

9. Environmental Competence, Training and Awareness

The Project Manage or Facilities Manager is responsible for ensuring the personnel who manage activities and/or perform the tasks are aware of their environmental roles and responsibilities, and are competent to analyze the environmental aspects arising from their activities, products and services that can impact the environment.

Induction Training

Prior to any individual commencing work in FIVE, the Environmental Representative conducts awareness training (induction). This training is conducted each time an individual is transferred to a new workplace location and is delivered in a language understood by the individual.

Tool-box Meeting and Briefing

Prior to the start of work, the Project Manager/ Facilities Manager is responsible for communicating to the employees the control measures stated in the Environmental Aspects and Impacts through toolbox meetings.
Weekly toolbox meetings on environmental topics are scheduled by the Environmental Representative in liaison with the Manager. Delivery of Toolbox talks are conducted by the Environmental Manager/Representative.

9.1 Environmental Training

When an individual has been assigned to perform tasks that would have a potential environmental impact(s) and lacks some of the necessary competencies to fulfill the associated environmental tasks, the HSE Officer organizes the appropriate training/competence

10. Identification of Aspects and Significant Aspects

The project activities and associated environmental aspects and impacts are assessed. The assessment has been conducted by the Environmental Representative and approved by the Project Manager. Specific Aspects and Impacts Assessment Spreadsheet is maintained to ensure that the significant impacts are monitored and proper controls in place.

The effectiveness of the policy in managing the anticipated environmental impacts would be greatly enhanced when used in conjunction with the high standard of civil and engineering best practice employed during the design and construction of such a project. An environmental risk register that will be used as a base to the project specific risk register.

10.1 Air Emissions Impacts

The movement of soils during grading and cut and fill activities is anticipated to lead to the generation of airborne dust that may transiently impact air quality. Where working with uncontaminated soils, such windblown dusts typically represent only a nuisance to those exposed. However, a number of measures will be implemented to control dust generation and its potential impact.

The operation of construction vehicles and plant equipment (exhaust emissions) and emissions from generators within the site (exhaust emissions).
Vehicle, plant, and equipment emissions represent a source of atmospheric releases during the construction phase of the Project. While they could result in an increase in the ambient air concentrations of emitted pollutants near to the source of the emissions, they would rapidly disperse. Further, as most emissions will be temporally and spatially distributed over the site, they would be unlikely to lead to any significant degradation of local or regional air quality and hence no impact to the biological environment or human health would be expected.
In addition, vehicle emissions would be minimized or rendered harmless (where possible) as a result of:

- The use (where appropriate) of catalytic converters and other vehicle emission reduction technologies;
- The regular performance maintenance of vehicle engines; and Natural dispersion
- Mixing of 5% green fuel where available

10.2 Dust

Dust or Particulate Matter may be emitted from various activities, including demolition, traffic along unpaved roads, wind from soil stockpiles, and graded or desert soil.The construction project has the potential to generate dust emissions, which can cause nuisance to those exposed. A prevailing wind direction could potentially be exposed to such dust emissions, under conditions of high wind speed. The principal sources of dust generation include:

- Earthmoving activities.
- Movement of vehicles on unlined roads; and

- Transport of fill material.
- Sediment tracking by vehicles

11. Gaseous Pollutants and Particulate Matter Impacts

Vehicle, plant and equipment emissions represent a source of atmospheric releases during the construction phase of the Project. While they could result in an increase in the ambient air concentrations of emitted pollutants near to the source of the emissions, they would rapidly disperse. Further, as most emissions will be temporally and spatially distributed over the site, they would be unlikely to lead to any significant degradation of local or regional air quality and hence no impact to the biological environment or human health would be expected.

Sources

- Fixed sources (e.g. flues, chimneys and exhausts e.g. generator sets)
- Mobile sources (e.g. Site vehicles and mobile plant)
- Fugitive emissions (e.g. escape through open doors or during delivery of chemicals, raw materials or dust blowing off stockpiles or yards

12. Surface Water Impacts

Sources of water pollution on the project will include: diesel and oil; paint, solvents, cleaners and other harmful chemicals; and construction debris and dirt. When land is cleared it causes soil erosion that leads to silt-bearing run-off and sediment pollution. Silt and soil that runs into natural waterways turns them turbid, which restricts sunlight filtration and has the potential to destroy aquatic life.

An increase in suspended sediment concentrations, caused by an increased amount of eroded materials entering waterways, could induce impacts on aquatic life within the environs. Impacts could also result from pollutants released from construction materials and equipment, such as fuels, lubricants, bitumen, concrete, and wash water from concrete mixing and water runoff from batching operations.

13. Soil and Ground Water Impacts

Pollutants on construction sites can also soak into the groundwater. Once contaminated, groundwater is much more difficult to treat than surface water. The prevention of leachate from any source within the site is therefore essential.

Increased traffic on the site as a result of construction activities and associated earth movements may potentially increase levels of erosion and increase surface water flow to waterways. As a result, these may potentially impact upon the receiving groundwater in the vicinity. The anticipated rainfall may potentially result in significant levels of erosion due to the lack of vegetation and the dryness of the soil at the site. Increased traffic on the site as a result of construction activities and associated earth movements may potentially increase levels of erosion and increase surface water flow to waterways. As a result, these may potentially impact upon the receiving groundwater in the vicinity. The occurrence of rainfall may potentially result in significant levels of erosion due to the lack of vegetation and the dryness of the soil at the site. However, the likelihood of rainfall is very low and thus the risk of erosion significantly reduced.

Discharges to land

There are two principal routes for soil contamination: direct contamination and indirect contamination. The former is often as a result of leachate, spillage or the polluting material directly entering the soil. The latter can be from airborne pollutants being washed into, or deposited on the ground. This has the potential to pollute vegetation and destroy habitat within.

Wildlife (Fauna)

There is no endangered wildlife in the project area. It is acknowledged that there will be a temporary impact on some bird species (reliant on existing vegetation) due to the removal of some terrestrial vegetation within the site during the construction phase of the development. However, the replanting of shrubs and adaptive vegetation will significantly reduce the long-term impact on such species.

Vegetation (Flora)

Any vegetation with significant ecological value will be preserved. Any identified trees will be transplanted to a temporary nursery within the site and relocated at a later date for landscaping purposes.

Noise and Vibration

The level of noise arising from equipment and machinery used in the project operations shall not exceed the limit of 90 dBA at a distance of 15 m from the boundary of the construction site.
Noise will be generated during the construction phase that may impact the local residents and other existing developments. The level of noise pollution will vary according to fieldwork activities. The major sources of noise and vibration during the construction phase will be from:

- Construction Equipment see e.g., excavators, bulldozers breakers grinders.
- Diesel Generators
- Batching plant operations
- Concrete crushing machine

The Project will also introduce a noise monitoring program where the site team will measure noise. Emissions and levels at predetermined points on the project boundary to monitor noise levels. The findings will be communicated to the client and any abnormal noise levels that may occur will be subject corrective action immediately if the results are found to exceed noise levels as stipulated in the noise limits table found.

14. **Gaseous Pollutants Managements Control of Exhaust Emissions**

The following measures will be applied to minimize exhaust emissions from vehicles and engines

- All vehicles will be maintained regularly, and a record of maintenance retained on site, to be available for inspection.
- Emissions should be free from significant black smoke from each vehicle and engine - remedial maintenance measures will be taken immediately when this is observed to improve engine efficiency. Plant and equipment used on an intermittent basis will be shut or throttled down when not in use.
- Emissions from stationary equipment will be minimized through operation of equipment in accordance with manufacturer's specification as far as practicable. Emissions from stationary equipment will be visually inspected for the presence of black smoke and maintenance measures will be made to rectify burner efficiency issues as necessary.

15. Mitigation Measures for Air Pollution

- The following mitigation measures are identified to limit / minimize the project-borne air quality impacts:
- Appropriate measures shall be implemented during earthworks, stockpiling, concreting, bitumen application and other construction works to suppress dust and prevent toxic fumes.
- All onsite equipment and machinery shall be maintained in good working condition to ensure safe operation.
- All equipment/machineries shall be equipped with standard emission control devices to minimize vehicle exhaust.
- Where possible, vehicles will not be left idling when not in use.
- Ensure in the project schedule that the area of cleared land is minimized during the drier months of the year, when the airborne soil erosion is at its greatest.
- Stock piling of earth materials for construction may be carried out within temporarily constructed enclosures to limit fugitive dust. All stockpiles not situated within temporarily constructed enclosures shall be covered or sprayed with water.
- Vehicles transporting earth materials and construction aggregates shall be covered en-route. Stockpiles of fines should be covered on windy days.
- Dust suppressants such as water spraying shall be applied on critical areas during periods of heavy activity or during dry periods to reduce dust generation. A watering truck shall be maintained on site for watering bare surfaces and critical blowing areas, as needed.
- Over-saturated conditions, which would cause outgoing trucks to track mud onto public streets, should be avoided. Watering would not be necessary on days when rainfall exceeds 2.5 mm.
- Mixing equipment should be sealed properly and vibrating equipment should be equipped with dust removing devices.
- Where appropriate, dust masks should be provided for workers in order to protect them from dust impacts
- Burning of trees, wastes and other materials shall not be carried out.

- For major incidents involving release of chemicals or other air pollutants resulting in major environmental damage or injury, the Contractor shall contact Local Authority - Environment Department, Civil Defense and the Health Department.
- The Project shall take action to control dust emissions on the construction site and modify control procedures (if required) to ensure compliance.

16. Odour Management

Mitigation Measures for Odour

- Keep water away from unsurfaced areas using measures such as cut- off drains
- Control and dispose of silty water in a controlled manner, all discharges other than clean rainwater,
- e.g. storm drainage, excavation dewatering wastewater, may require a consent. Adequate treatment (e.g., settlement) should be provided before discharge.
- Any discharges to land must be analyzed to establish if there are any pollutants which may impact flora and fauna in the vicinity.
- Discharges with fairly coarse particles (but no other pollutants) and relatively small flows may be treated easily and cheaply by passing them through steel tanks or even skips filter, such as fine single size aggregates (five to 10 mm), geotextiles or filtration socks can be added for further treatment. If this solution is used there should be careful control of the discharge quality and a mechanism to close down the flow.

17. Soil Erosion and Sediment Control Plan

Soil Erosion

Erosion is the natural process of wearing away land by water, wind and gravity. Onsite construction activities will disturb the site soils and expose bare soils/surfaces to the erosive force of water and wind. The extent of erosion will be a function of facility design and construction methods used, and will be related to type of material, terrain type, soil type, bare surfaces, rainfall events, drainage regimes and intensity of the prevailing winds. Erosion control measures shall be designed and implemented according to standard industry practices. The following mitigation measures are identified to limit / minimize soil erosion induced by project activities.

Measures to reduce surface water flow and erosion include:

- Whenever possible, construction activities are not to be scheduled when there is significant potential for heavy rainfall and upon the event of a storm event / should stop; Backfilling activities shall be undertaken in horizontal layers with soil having previously been dampened. Soils will be immediately compacted in situ to minimize erosion;
- Inspect all vehicles and equipment for dirt prior to entering or leaving the site to prevent or minimize excessive dirt migration;
- All vehicle maintenance activities shall be carried out at a designated and clearly identified location; and
- Maintenance of vehicles will be undertaken using drip trays in all instances.
- The proper storage of fuels and chemicals at the Project site are vital to prevent groundwater contamination. The project will implement the following procedures:
- Lubricants, waste oil and chemical storage areas will be constructed on a concrete base. An impervious surface coating will be applied to the base and walls. The containment area will have the capacity to contain 110% of the total volume of stored materials.
- Vehicles and mobile equipment should be inspected weekly and maintained to confirm that they are not leaking or dripping.
- Drip trays should be placed under generators.
- For bulk storage of fuels, double-walled tanks meeting international standards should be used. Alternatively, single wall tanks may be used provided they are mounted on a concrete base and bonded to contain 110% of the total volume of stored fuel. An impervious surface coating should be applied to the base and walls.

- During bulk fuel tank filling, the Project Environmental Protection Officer will be present in order to avoid overfilling of the tank. In such an instance, an Incident Report Form shall be prepared.
- Drains within bund walls (if applicable) will be checked weekly to ascertain that they are closed.
- Bulk storage vessels should be pressure tested to ensure integrity before use.
- Refueling will only be carried out in designated areas following specified procedures to reduce potential spillages. Refueling areas should be communicated to all site personnel by signs and notice boards.
- Spillages or leakage resulting in soil contamination will be cleared. Contaminated material should be removed and disposed of using a Authority approved waste disposal providers where appropriate.
- Vehicles and mobile equipment to be regularly inspected and maintained to confirm that there are no oil or fuel leaks. Operators shall be instructed to notify their supervisors if there are any problems with their vehicles.
- Hazardous materials to be handled only by operators trained in the relevant handling and spill response procedures.
- All stationary diesel and petrol operated construction equipment are to have impervious drip trays placed beneath them during operation. Any spillages into the drip trays to be collected for safe disposal at an Authority approved facility. If excessive dripping occurs equipment should be sent for maintenance.
- Waste water from the wash basins, kitchens and shower units (if applicable) should be directed to a dedicated 'grey water' storage tank. Consideration should be given to the appropriate re-use of grey water wherever possible.

18.Soil Erosion Management

Site constraints, including; buildable areas, soils, topography, vegetation and water limitations, shall be identified in the engineering drawings. Land clearing and grading shall be restricted to buildable areas (project activity areas), thus localizing the effect.

- Construction equipment will be confined to the project corridors. Care shall be exercised in construction plant operation to minimize the extent of disturbed areas (i.e. minimize the movement of soil mobilized by operation of vehicles and machinery during the construction phase).
- Re-vegetation techniques shall utilize self-sustaining plant communities. Seed mixtures particularly suitable for use in arid and semi-arid environments shall be used in the revegetation programs.
- Ensure in the project schedule that the area of cleared land is minimized during the drier months of the year, when the airborne soil erosion is at its greatest.
- Precautionary engineering measures (such as cut-off trenches, etc.) should be implemented to reduce sediment laden run off.
- Sediment fences shall be erected, inspected, maintained and cleared after major storm events. The sediment collected shall be stockpiled and reused or disposed of appropriately.
- Stockpiles of sediment generating material such as sands and soils shall be located on flat and well grassed area, away from drainage lines.
- Stockpile locations shall be indicated by clear signage on limits of dumping;
- Monitor to determine if erosion protection devices have been installed in accordance with contract requirements and their effectiveness in controlling soil erosion.
- The Project shall investigate and implement alternative soil erosion management measures, following incidents.

19.Workshops and Repair Areas

All maintenance and wash down of vehicles and machinery on the construction site have the potentials to cause soil and water contamination, and therefore mitigation measures are warranted to limit/minimize any offsite migration of leachate. The management of onsite workshops and repair facilities to minimize environmental risks is described herein.

Mitigation Measures

- Hazardous liquid wastes from these activities must be collected, treated or disposed of by the Contractor in accordance with the applicable OM Standards.
- The Contractor will obtain relevant approvals from Project Proponent / Owner before workshop and repair facilities are established on-site.
- The workshop and repair areas will be contained within the Contractor's site boundary.
- The workshops will be erected on hardstand areas and will drain to a collection sump. The sump will be regularly emptied and the contents will be disposed of as hazardous waste in accordance with OM requirements.
- Vehicle/equipment repairs and servicing will be restricted to the workshop area only. For broken down vehicle that cannot be moved, a pan or protective liner will be used to prevent ground contamination.
- Activities involving chemical solutions (e.g. paint mixing and oil changing) will be carried out in locations with a sealed surface. Accidental leakage of such liquids will be contained and cleaned up immediately to prevent contamination of surrounding areas.
- Mobile spill containment equipment and material will be kept at the workshop for clean- up of spills.
- Precautions will be taken to limit the discharge of volatile substances during painting and blasting (e.g. fumes and dust/grit dispersal into the air). Wherever practicable, these works will be conducted within an enclosed and ventilated area.
- Water contaminated with suspended materials, hazardous waste, or volatile materials (e.g. mineral spirits, oil or paint thinner) will be collected and discharged to the collection sump in accordance with standard industry practices.

20. Water Quality Control Plan and Marine Ecology Control Plan -Wastewater Management

Water Discharge from Construction/Demolition/Excavation Materials Storage:

- Minimize. the areas of exposed ground
- Locate siltation traps at key points on the site (areas where the ground slopes or run off could enter groundwater or a river or the sea) and discharge all runoff through the traps.
- Provide adequate drainage channels lined with impervious material.
- Regularly inspect drains for structural defects and maintain drains (e.g. remove silt regularly).
- Ensure integrity of hoarding to prevent uncontrolled discharge to storm water drains outside site boundaries.
- Where not possible to install temporary water drainage works as above, use sandbags (and sealed hoarding) to divert site water run-offs to siltation tank and water treatment systems.
- Avoid carrying out earthworks during the rainy season and if is not avoidable ensure that the works are kept to a minimum.
- Cover temporarily exposed slopes and stockpiles by tarpaulin, etc. protect access road by crushed stone or gravel (as excavation proceeds) and provide intercepting channels (along edge of excavation).
- Surround earthworks by dikes or embankments for flood protection and cover earthworks as appropriate.
- To prevent soil erosion, compact earthworks final surfaces and perform subsequent permanent
- Work/surface protection immediately after surface formation and provide appropriate drainage.
- Cover and seal manholes (including newly constructed ones).
- Reuse water used in ground boring and drilling for site investigation or rock/soil anchoring as far as practical after sedimentation.
- Ensure that the road from the wheel washing facilities to the end of the site is paved with back fall to prevent runoff of wash water.
- Discharge water from the wheel wash and car-washing facilities through a sediment trap.
- Sedimentation Tanks:

- Position sediment tanks upstream and downstream of any modified culvert sections in order to minimize sediment loading.
- Ensure out flow from the sediment traps is low enough and trap design allows for settling of deposits at bottom
- Design sediment traps taking into account seasonal variations in rainfall.
- Control water flow into the tank to allow for sedimentation by provision of additional retention tanks, etc.
- Cover tanks to minimize deposition of debris and silt.
- Maintain pipes from tanks in good condition to minimize leaks and spills of treated water that can pick up debris and silt and must be treated again.

21. Concrete Batching and Precast Concrete Casting Wastewater

- Recycle wastewater from washing of mixer trucks, drum mixers and similar equipment wherever practical to minimize wastewater discharge.
- Provide standby pumping for recycling system to avoid pollution from wastewater overflow.
- After treatment of surplus wastewater for silt by means of siltation tank and pH adjustment facilities to pH 6-10, discharge into foul sewer.
- Employ more elaborate treatment for discharge into storm water drains.
- Treat all contaminated surface water from concrete operations with appropriate facilities.

22. Oil Contaminated Water

- Locate dip trays underneath trucks and equipment for fueling and maintenance.
- Provide secondary containment and roofing for vehicle plant servicing areas, vehicle wash bays and lubrication bays (if any).
- Use oil interceptors to remove oil and grease, and dispose the sludge as chemical waste.
- Dredging and Reclamation
- Design, use and maintain mechanical grabs to avoid spillage of materials into sea and tightly sealed for lifting operations;
- Use barges and hoppers equipped with tight fitting seals on bottom opening to avoid material leakage;
- Use watertight grabs/pneumatic sucking systems for dredging of contaminated mud;
- For inaccessible dredging sites by barges, use water-tight trunk for delivery of dredged sediment to barging point for marine disposal; and
- Minimize turbidity from vessel movement and propeller wash by sizing vessels for adequate clearance between vessels and seabed in all tide conditions;
- Remain vessel stationary throughout dumping operation; and
- Do not over filling of barges and hoppers which causes overflow of materials or polluted water during loading or transportation;
- Control loading/unloading operations of barges and hoppers to avoid splashing of dredged/filling 'materials;
- Discharge mud as rapidly as possible and immediately close hopper, without washing out material adhering to sides of hopper, and hopper remain closed until next dumping operation;

23. Toilet and Kitchen Sewage Discharges

A. Septic Tank and Soil Soak away System

- Discharge sewage from toilets and kitchens into foul sewer as possible.
- Use septic tank and soil soak away system if connection to foul sewers impermissible.

- Use sewage treatment system for large flows.

B. Grease Trap (if catering facilities are provided on Site):

- Discharge all wastewater from canteen kitchens into foul sewer via grease traps.
- Screen out solids by installing filters at the tap inlets.
- Arrange collection of grease trap waste by licensed collector(s).

24. Noise and Vibration Control Plan

The noise pollution in the vicinity of the development shall be minimized by adoption of appropriate noise mitigation measures including restricting construction works to normal construction hours.

25. Mitigation Measures

The following mitigation measures are identified to limit / minimize the onsite noise propagation levels:

- A site-specific Environmental Noise and Vibration Management plan detailing how noise levels and other disturbances shall be kept to a minimum during construction works to be in place when construction work commences
- Construction equipment that are to be used on the site should comply with the Authority - Environment Department noise limits by equipping them with appropriate noise reduction devices prior to being operated on the site.
- Construction equipment should be maintained in proper conditions and operated in accordance with manufacturers' recommendations.
- Equipment and machinery shall only be operated by trained and experienced operators (operator's certification must be shown on request).
- Electrically powered plant should be preferred, where practicable, to mechanically powered alternatives. All mechanically powered plant should also be fitted with suitable silencers.
- Construction machineries operating intermittently should be shut down in the intervening periods between uses.
- Construction activities will be kept within operating hours. Truck deliveries should be programmed to arrive during core daytime hours only.
- Care should be taken when unloading vehicles to minimize noise. Unnecessary idling, revving or inappropriate use of machinery shall be prohibited.
- Deliveries should be routed so as to minimize disturbance to local residents and delivery vehicles should be prohibited from waiting within or near the site with their engines running.

COMMUNICATION

FIVE has communicated its sustainable environmental guidelines to all its colleagues (key user department POCs) and the Project team through periodic email communications. All colleagues within the Group are informed to comply with the sustainable environmental guidelines mentioned in this document.

Any colleague who has questions or concerns about this policy should speak with the Project team or the Sustainability Committee.