7. LANDSCAPE AND VISUAL

7.1 Introduction

7.1.1 The EIA has recommended the EM&A for landscape and visual resources is undertaken during both the design, construction and operational phases of the project. The design, implementation and maintenance of landscape mitigation measures is a key aspect of this and should be checked to ensure that they are fully realised and that potential conflicts between the proposed landscape measures and any other project works and operational requirements are resolved at the earliest possible date and without compromise to the intention of the mitigation measures. In addition, implementation of the mitigation measures recommended by the EIA will be monitored through the site audit programme.

7.2 Mitigation Measures

7.2.1 The Landscape and Visual Assessment of the EIA recommended a series of mitigation measures for the construction phase to ameliorate the landscape and visual impacts of the project. These measures include the following, which are also summarised in the environmental mitigation implementation schedules provided in Appendix A:

- the construction programme for the PAFF should be reduced to the shortest possible period and should be executed in phases, with future phases of tanks built in sets of 2-4.;
- the extent and periphery of the works areas should be managed so that they are as small as possible and do not appear cluttered, untidy and unattractive, particularly to road traffic along Lung Mun Road;
- temporary hoarding barriers should be of a recessive visual appearance in both colour and form;
- materials should be stored in areas with the least obstruction to residents, pedestrians and traffic;
- all material stockpiles should be covered with an impermeable material and sandbagging diversions should be placed around exposed soil;
- temporary landuses should be implemented on the area of site not initially required for tanks comprising earth mounding with hydroseeding and quick-growing tree planting.;
- a raised bund/earth mound comprising containment bund-wall, access road and planting buffer shall be built around the tank farm;
- transplantation of existing road side whips affected by the proposed works and new compensatory planting works should be carried within the first year of construction;
- the design of the PAFF should incorporate materials, details and textures which are visually recessive;
- non-reflective neutral grey colours with low chromatic intensity to reduce the potential contrast between the tanks and their background;
- building roofs should have a thin edge and walls should be set back and be dark either in colour or by being in shadow;
- light colours and tones of grey, green and blue shall be used for all buildings;

- building roof shall be durable insulated, self cleansing, rigid curved metal cladding system (either steel or aluminum) with a non-reflecting matt and/or textured) finish;
- building external walls shall be finished in an aluminum panel and general walls to be finished in ceramic tile (self cleaning/dust-proof) and/or durable textured external spray paint;
- visually permeable security fencing should be used around the perimeter;
- minimum amount of lighting for the tanks, only applied for safety at the key access points and staircases;
- limited lighting intensity on the site; and
- directional down lighting is suggested to minimise light spill to the surrounding.

7.3 Design Phase Audit

7.3.1 The landscape measures proposed within the EIA to mitigate the landscape and visual impacts of the scheme should be embodied into the detailed landscape design drawings and contract documents including the protection of existing trees where possible, the transplanting of existing trees and the planting of new trees and shrubs. Designs should be checked to ensure that the measures are fully incorporated and that potential conflicts with civil engineering, geo-technical, structural, lighting, signage, drainage, underground utility and operational requirements are resolved prior to construction.

7.3.2 The design phase EM&A requirements for landscape and visual resources comprise the audit of the detailed landscaping and visual specifications to be prepared during the detailed design together with ensuring that the design is sensitive to landscape and visual impacts and that landscape resources are retained as far as practicable. Monitoring of design works against the recommendations of the landscape and visual impact assessments within the EIA should be undertaken as and when the designs are produced to ensure that they fulfil the intentions of the mitigation measures.

7.3.3 The landscape and visual auditor shall review the designs as and when they are prepared and liaise with the landscape architect and design engineer to ensure all measures have been incorporated in the design in a format that can be specified to the Contractor for implementation. In the event of a non conformity, the Event/Action plan as detailed in Table 7.1 below should be followed.

Table 7.1 Event / Action Plan for Design Phase

Action Level	Landscape and Visual Auditor	Project Engineer (PE)	Project Landscape Architect (PLA)
Non Conformity (with Design Standards and Specification)	• Identify Source • Inform PE and PLA • Discuss remedial actions with PE, PLA • Verify remedial actions when complete	• Notify PLA • Discuss remedial actions with PLA • Ensure remedial designs are fully incorporated	• Amend designs • Discuss remedial actions with PE

7.4 Baseline Monitoring

7.4.1 Baseline monitoring for the landscape will comprise a vegetation survey of the vegetation and trees on the site. Representative vegetation types will be identified along with typical species composition.

7.4.2 The landscape and visual baseline will be determined with reference to the landscape and visual impact assessments included in the EIA Report.

7.5 Construction and Operational Phase Audit

7.5.1 A specialist Landscape Sub-Contractor should be employed by the Contractor for the implementation of landscape construction works and subsequent maintenance operations during the 24 month establishment period. It is proposed that as the majority of the planting works in the area not to be development initially, the planting should be conducted within the first half of the construction contract. Thus, the establishment works will be undertaken through the latter half of the construction contract. The intention is to provide at least 24 months establishment period for the majority of the planting works.

7.5.2 All measures undertaken by both the Contractor and the specialist Landscape Sub-Contractor during the construction phase and first year of the operational phase shall be audited by a Registered Landscape Architect, as a member of the ET, on a regular basis to ensure compliance with the intended aims of the measures. Site inspections should be undertaken at least once every two weeks throughout the construction period and once every two months during the operational phase. The broad scope of the audit is detailed below but should also be undertaken with reference to the more specific checklist provided in Table 7.2. Operational phase auditing will be restricted to the last 12 months of the establishment works of the landscaping proposals and thus only the items below concerning this period are relevant to the operational phase.

- the extent of the agreed works areas should be regularly checked during the construction phase. Any trespass by the Contractor outside the limit of the works, including any damage to existing trees shall be noted;
- the progress of the engineering works should be regularly reviewed on site to identify the earliest practical opportunities for the landscape works to be undertaken;
- all existing trees and vegetation within the study area which are not directly affected by the works are retained and protected;
- the methods of protecting existing vegetation proposed by the Contractor are acceptable and enforced;
- preparation, lifting transport and re-planting operations for any transplanted trees;
- all landscaping works are carried out in accordance with the specifications;

- the planting of new trees, shrubs, groundcover, climbers, ferns, grasses and other plans, together with the replanting of any transplanted trees are carried out properly and within the right season; and

- all necessary horticultural operations and replacement planting are undertaken throughout the Establishment Period to ensure the healthy establishment and growth of both transplanted trees and all newly established plants.

Table 7.2 Construction/Operational Phase Audit Checklist

Area of Works	Items to be Monitored
Advance planting	monitoring of implementation and maintenance of planting, and against possible incursion, physical damage, fire, pollution, surface erosion, etc.
Protection of all trees to be retained	identification and demarcation of trees / vegetation to be retained, erection of physical protection (e.g. fencing), monitoring against possible incursion, physical damage, fire, pollution, surface erosion, etc.
Clearance of existing vegetation	identification and demarcation of trees / vegetation to be cleared, checking of extent of works to minimise damage, monitoring of adjacent areas against possible incursion, physical damage, fire, pollution, surface erosion, etc.
Transplanting of trees	identification and demarcation of trees / vegetation to be transplanted, monitoring of extent of pruning / lifting works to minimise damage, timing of operations, implementation of all stages of preparatory and translocation works, and maintenance of transplanted vegetation, etc.
Plant supply	monitoring of operations relating to the supply of specialist plant material (including the collecting, germination and growth of plants from seed) to ensure that plants will be available in time to be used within the construction works.
Soiling, planting, etc.	monitoring of implementation and maintenance of soiling and planting works and against possible incursion, physical damage, fire, pollution, surface erosion, etc.
Decorative treatment of site hoarding	implementation and maintenance, to ensure compliance with agreed designs.
Architectural treatment of retaining walls, elevated road structures and other engineering works.	implementation and maintenance of mitigation measures, to ensure compliance with agreed designs.
Establishment Works	monitoring of implementation of maintenance operations during Establishment Period

7.5.3 In the event of non compliance the responsibilities of the relevant parties is detailed in the Event /Action plan provided on Table 7.3.

Table 7.3 Event / Action Plan for Construction Phase

Action Level	ETL[(1)]	IEC[(1)]	FSR[(1)]	Contractor[(1)]
Non-conformity on one occasion	1. Identify Source 2. Inform the Contractor, IEC and the FSR 3. Discuss remedial actions with the IEC, the FSR and the Contractor 4. Monitor remedial actions until rectification has been completed	1. Check report 2. Check the Contractor's working method 3. Discuss with the ETL and the Contractor on possible remedial measures 4. Advise the FSR on effectiveness of proposed remedial measures. 5. Check implementation of remedial measures.	1. Notify Contractor 2. Ensure remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	1. Identify Source 2. Inform the Contractor, IEC and the FSR 3. Increase monitoring frequency 4. Discuss remedial actions with the IEC, the FSR and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If exceedance stops, cease additional monitoring	1. Check monitoring report 2. Check the Contractor's working method 3. Discuss with the ETL and the Contractor on possible remedial measures 4. Advise the FSR on effectiveness of proposed remedial measures 5. Supervise implementation of remedial measures.	1. Notify the Contractor 2. Ensure remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake any necessary replacement

(1): ETL – Environmental Team Leader, IEC – Independent Environmental Checker, FSR – Franchisee's Site Representative