9. ENVIRONMENTAL IMPACT ASSESSMENT AND MONITORING

9.1 Environmental Laws and Regulations in Malaysia

The Environmental Quality Act,1974 is in its seventeen year of implementation. In 1989,new enactment of regulations for control and safe disposal of toxic and hazardous wastes were made. The EIA of whole area for Kulim Hi-Tech Industrial Park was conducted according to the Environmental Quality Order, 1987 which ç the siting of any major projects are to be prescribed under this Order by the Malaysian consultant under assistance of JICA study team.

9.2 Summary of Environmental Impact Assessment (EIA)

An industrial estate or housing estate covering an area of 50 ha or more are prescribed activities requiring EIA as determined by the Order 1987. The EIA for this park has been carried out in accordance with the " A Handbook of Environmental Assessment Guideline,1987 " for the whole area. Assessment of potential impacts due to project activities were carried out. Major items were climate and air quality,water quality, hydrology, flora and fauna, population perception and socio-economy. The impact of project activities identified on various environmental components (physio-chemical, biological and human) was determined using baseline data. The significance and degree of importance of each impact for various project activities was presented in matrix form. Mitigation measures were ç formulated for each potential impact identified with respect to each project activity. Measurement facilities, for example, are flood retention pond,waste water central treatment plant, temporary storage yard for industrial solid waste, oxidation pond, fish pond and water sampling pit which were planned and proposed by JICA study team. It was determined that there are no apparent residual adverse impacts associated with the project. However there are significant socio-economic benefits.

9.3 Post Construction Environmental Monitoring

A post-construction monitoring program which includes individual industry monitoring activities and overall surveillance monitoring activities was proposed.

9.4 Responsibilities of Management Company

The responsibilities of management company which carry out the environmental monitoring are identified.

9.5 Agreements on Environmental Aspects

Recommendations regarding agreements concerning environmental aspects were made and sample format the agreements was presented.

10. CONCLUSION AND RECOMMENDATIONS

The basic design study for first phase industrial zone of 250 ha on the establishment of Kulim Hi-Tech Industrial Park shall recommend the following action plans for its successful implementation.

(1) Implementation schedule

1) First phase industrial zone
Land preparation of first phase industrial zone should be scheduled to be completed by middle of 1993.

2) Other zones in first phase
First phase other zones (housing, R & D, urban and amenity) be completed partially to meet with the basic requirement of first phase industrial zone.

3) Related infrastructure for first phase industrial zone
Stepwise construction is recommended for infrastructure development related to the first phase industrial zone as :

1st step : middle 1993	Completion
2nd step : end 1993	Completion
3rd step : end 1994	Completion

Coordination and detailed clarification on scope of works among agencies concerned for related infrastructure works are necessary. Required construction period for major infrastructure works will be 2 years or more. Therefore, necessary action such as tender design and budgetary appropriation should be completed within 1992 under the such coordination and clarification.

(2) Introduction of public R & D and university

The introduction of private industries as well as their R & D departments to such an isolated area or a new town to be created is rather difficult. An appropriate approach would be that public R & D institutions and universities should be introduced at the outset in order to encourage acceleratedly invitation of private industries. Formal procedure to introduce those institutions should be taken as soonest possible.

(3) Technicality

For subsequent consulting works such as tender design and detailed design, the following technical recommendations on infrastructure development should be duly adopted.

1) Road network

Primary access road of 2 lanes with full stretch should be constructed in parallel with the completion of first phase industrial zone, and be expanded to 4 lanes with 40 m reserve width in future.

2) Power supply system

The ring formation system should be introduced from TEN's 275 kV power grid by 132 kV transmission lines. Further, ring form connection with double circuits system are to be applied for 33 kV and 11 kV distribution lines for major consumers in order to secure reliable and stable supply.

3) Water supply system

Service reservoirs should be designed having sufficient capacity for the whole area of the Hi-Tech park. R1 and R2 reservoirs are to be constructed with 33,900 m3 and 32,000 m3 in capacity and to meet with the schedule for first phase industrial zone.

4) Telecommunication system

Telephone lines of 900 by 1993 and 5,000 by 1996 should be connected with the Kulim switching centre. Fiber optics junction is to be created to meet with the schedule for first phase industrial zone. For international and nation wide telecommunication system, optical fiber long distance transmission line is also to be installed.

5) Drainage system

Return period of 20 and 100 years should be adopted for drainage channel, ditch and retention pond respectively.

6) Sewerage system

Separate system is adopted, and individual treatment at each factory should be applied according to the "ppp". Central treatment plant is to be constructed as for the domestic wastewater. A treatment method is an activated sludge process. Fish ponds should be provided for the monitoring.

7) Industrial waste management

Temporary secure storage site with facilities should be provided with 25 years capacity. A manifest tracking system is to be applied for monitoring the industrial waste.

(4) Financial Analysis

The financial analysis has been undertaken on the first phase of industrial zone alone excluding housing, urban and amenity zone components. As seen above the result was unfortunately not favorable. The substantial support by the Government such as tax exemption and subsidy provision, is thus essential. A concessionary loan from foreign donors for related infrastructure development would be also commendable.

In this connection it is noted that the Master Plan Study is now being underway and it covers the areas of industrial zone as well as housing, urban and amenity zones in the proposed Hi-Tech Park. It is suggested, therefore, that the Master Plan Study should re-examine the said financial results from the view point of cross-subsidization of the project by additional revenues of housing and other facilities sales.

(5) Investment promotion

For investment promotion, a task force should be established headed by MIDA, and the following action is needed in early stage.

1) Identification of potential hi-tech industries
2) Project launching seminar
3) Investment promotion visits/missions
4) Kulim Hi-Tech Industrial Park investment seminar
5)Direct mailing campaign

(6) Implementing organization

An implementing organization involving fully responsible agency and supporting agencies is required to establish in order to undertake smooth implementation.