7.2 Guideline for Acquisition of Disposal Site

7.2.1 Present Situation

Aside from the operation of New Abis Compost Plant with the processing capacity of 160 ton/day (as of January 1985), the solid waste management in Alexandria is composed of 2 major frames - collection and disposal.

It can safely be said that reasonable improvements on the collection frame, such as the establishment of public collection system and introduction of foreign assistances, have been made out f necessity that they have no choice but to physically remove solid wastes from the city.

On the other hand, as for the disposal frame, it has been only places where collected wastes are disposed of. And since persons in charge of the solid waste management have had an idea that there exist an unlimited number of places for disposal sites in and around the city, they have dealt with the situations with a make-shift policy.

- The amount of solid wastes generated in the city was little.
  (Wastes have been disposed of within the vicinity of the generated areas.)

- There existed a number of undeveloped vacant spaces such as Lake Maryut in and around the city.

- Except for the urban area and farmlands, most lands were publicly-owned lands, and no land acquisition cost was required as long as the public lands are used for public purpose. The public authority or agency to which the land falls under and the cleansing authorities.

However, with the recent rapid urbanization, which caused a lack of vacant land, and a rise in the standard of living, which increased the amount of solid wastes generated, as well as residents' enlightened awareness of wastes, it has become impossible to deal with disposal frame with a conventional idea for disposal site. And they have confronted a serious shortage of disposal sites at present.

For Lake Maryut, which has long been considered to be a disposal site for an unlimited period of time, landuse of the lake for such as salt farm, industrial complex and housing complex has been already decided in the Comprehensive Plan 2005. As for remaining undecided portions, the reclamation is strictly prohibited by the Lake and Canal Conservation Law (Law No. 124 and 465, effective in 1983). In addition, voices are gaining momentum from ministry of agriculture officials and fishermen to preserve fishing resources. For these reasons it seems difficult to use the lake as a disposal site a present.

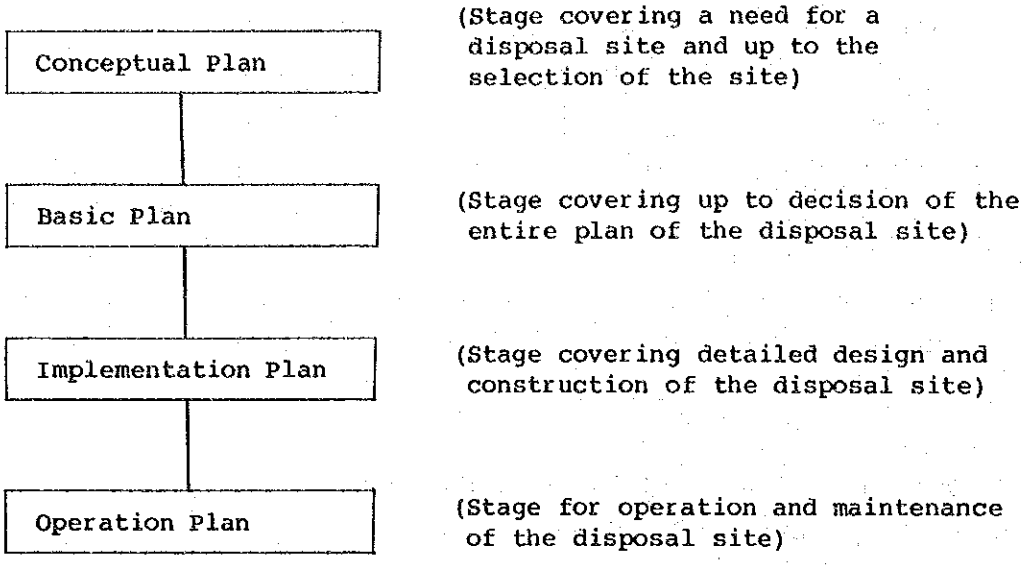
Furthermore, in spite of the fact that disposal plays an essential role of solid waste management along with collection, no adequate planning and budgetary allocations have been made for disposal.

A great deal of interest has presently been shown by the administrative authorities to improve a very attractive intermediate treatment system - namely, to use solid wastes as natural resources. The crucial point, however is to realize the fact that a disposal site is absolutely required, even if the intermediate treatment system were improved sufficiently. Even if a compost plant is constructed by the year 2000, which will cover the entire city, the reject amount generated at the compost and to be disposed of at the disposal site will never vary from that in 1985, because of the increase in the amount of solid wastes generated.

As mentioned so far, the present disposal process in Alexandria is at the turning point. A steadfast planning and concreteness is required for the disposal process from now, instead of the unplanned system up to today. In the following section a systematic final disposal planning, which has not been established in Alexandria, is outlined.

7.2.2 Flow of Final Disposal Process Planning

The flow of a series of plan for final disposal process according to each stage, ranging from selection of site, design, landfill operation to ultimate use of the completed site is described, from a standpoint of civil engineering planning, as follows;



The flow of the entire planning for final disposal process is mentioned below; if present conditions in Alexandria are taken into account, there may be some unnecessary plans at present. But, from a long-term perspective, it can be considered that there will arise a situation in which, with a rise in the living standard, progress in urbanization as well as changes in resident's public sentiment, the acquisition and landfill operation of a disposal site will not successfully be completed without taking into account all of these plans.

(1) Conceptual Plan

The conceptual plan is made to gain approval from various quarters, concerning the construction of the final disposal site. At the same time the plan must be made for the planning body and decision makers to fully understand usefullness, safety, environmental and esthetic safety, as well as to grasp feasibility and necessary cost.

The master plan of this study corresponds to the conceptual plan; major items for work which should be done at this stage are stated as follows;

a. Estimation of the solid waste generation rate and preparation of the disposal plan based on the estimation

b. Decision of the planned final disposal amount

c. Establishment of concepts for the final disposal site

d. Selection of prospective sites for construction of the final disposal site ---- collection of the existing data, field survey, etc.

e. Study on applicability of the prospective sites ---- basic study for natural and social environment; feasibility of construction work such as technical applicability, landuse, economic factors and peripheral conditions; possibility of acquisition of the land for the disposal site such as legal regulations and peripheral conditions

f. Study on the outline of major facilities

To grasp the entire picture of each prospective site ---- facilities of landfill site, facilities for environmental conservation, access roads and ultimate use of completed site; study on environmental impact for each prospective site; estimation of necessary cost for each prospective site

g. Decision making of the planning body

h. Agreement of the place for construction of the final disposal site

i Decision of the place for construction of the final disposal site

(2) Basic Plan

The stage in which to make the conceptual plan concrete. The feasibility study of the MBSDS construction project for this study corresponds to the basic plan. Major items of the work to be done at this stage are stated as follows;

a. Execution of various studies

Natural conditions ---- studies for geological and topographical conditions, water quality, meteorological conditions, sea conditions, present conditions of canals to which treated waste water is discharged as well as records and traces of disasters, etc.

Social conditions ---- Present landuse and landuse plan for proposed land and sea; traffic volume survey for road and harbor; survey for ecological conditions and historic relics

Solid wastes, secular change of solid waste coefficient of equivalent volume

b. Settlement of various terms ---- location, surrounding conditions, conditions for solid wastes, landfill work conditions, operation and maintenance conditions, etc.

c. Study of environmental impact

d. Selection of structural types of each facility ---- function and effectiveness, executability of works, safety, scenery, ultimate use and economic factors

e. Decision making for the construction project of the final disposal site ---- the whole system, construction schedule, construction cost and allocation of financial resouces

f. Agreement between local residents and people concerned

g. Decision of the basic plan

(3) Implementation Plan

Stage in which to construct the final disposal site.

Major items of the work to be done at this stage are stated as follows;

a. Various supplementary surveys

b. Detailed design of each facility

c. Scheme of execution ---- tendering scheme, construction method, procurement and budgetary plan

d. Assessment of environmental impact

e. Agreement between local residents and people concerned

f. Execution of construction project

(4) Operation Plan

Stage in which to make a plan for efficient operation of embodied facilities. It is important to make a landfill operation plan and an environmental monitoring plan at this stage.

a. Embodiment of landfill operation ---- landfill method, allocation of manpower and landfill equipment

b. Operation and maintenance of facilities

c. Monitoring for surrounding environment

d. Report to local residents and people concerned

e. Filing and compiling of operation control data and environmental conservation data

The flow of the entire planning for final disposal is shown above;

7.2.3 Guideline

(1) Selection of the site

In constructing the final disposal site, technical and economic issues are crucial; but, far more important is the acquisition of the site.
Generally, it can be said that 70% to 80% of a final disposal site project is completed when the site is acquired.
For ensuring the acquisition of the site, it is necessary to select the proper site for final disposal.
It should not be forgotten that; "Selection of the site is the key to the success in final disposal process"

Judging from the present situations of the final disposal in the city of Alexandria, the most important part of the plan is the selection and acquisition of the final disposal site.
For the moment, success or failure of the final disposal project depends fully on this issue. Therefore, terms to be considered for selection of the final disposal site are provided below.
Basic terms for selection of the site are mentioned as follows;

a. Feasibility of construction of the disposal site
b. Possibility of acquisition of the site
c. Efficiency for operation and maintenance of the disposal site
d. Possibility of ultimate use of the completed site

(2) Evaluation Items for Selection of the Site

In studying the afore-mentioned basic terms, it is necessary to evaluate them from various standpoints such as law and regulations, natural environment, landuse plan and economic factors. The evaluation items for each terms are listed in S.R. Tab. 7-2-1 .

S.R. Table 7-2-1 EVALUATION ITEMS FOR SELECTION OF THE SITE

Basic Terms	Rough Evaluation Items		Detailed Evaluation Items
(1) Feasibility of construction of the Disposal Site	Technical Aspect	Construction Aspect Disposal efficiency Aspect	a. Suitability in geological and topographical conditions b. Capacity of landfill volume of the site c. Suitability for construction of the disposal site d. Facility to obtain construction materials
		Disaster Prevention Aspect Environmental Conservation Aspect	e. Safety from land collapse such as land slide due to changes in topography f. Safety for stream regimen of the river due to changes in topography g. Safety for water-utilization of surrounding waters such as canal, lake and seashore
	Landuse Aspect		h. Conformity with laws and regulations i. Compatibility with the urban development and other urban systems j. Approvability for natural environment such as scenery and ecological system
	Economic Aspect		k. Possibility of approval of construction cost of the site and the appurtenant work
(2) Possibility of acquisition of the site	Land Ownership Status Economic Aspect Agreement from Local Aspect		l. Capability of acquisition of land judging from land ownership status m. Economic capability of acquisition of land including land lease n. Capability to gain approval from people concerned
(3) Efficiency for operation and maintenance of the disposal site	Landfill Operation		o. Work efficiency for landfill operation judging from topographical conditions p. Safety from pollution q. Haulage efficiency including economical efficiency
	Maintenance and Management		r. Facility for operation of the facilities judging from the location and topography s. Suitability for monitoring environmental conditions t. Accessibility for the vehicles and availability of utility u. Availability of cover material
Possibility of ultimate use of the completed site			v. Compatibility with the long-term plan such as comprehensive regional development plan w. Capability to make the ultimate use plan of the compacted site useful for local people

(3) Guideline

In practically selecting the site, a comprehensive evaluation must be made for each prospective site in lights of items listed in S.R. Table 7-3-1. After the appropriate selection of the site, administrative procedure required for the acquisition of the site will be taken by the persons concerned.

Since S.R. Table 7-3-1 includes comprehensive evaluation items, if present conditions in Alexandria are taken into account, there are some unnecessary items at present. Therefore, according to the present condition of Alexandria, the above-mentioned items are transformed into the following guideline for selection of the disposal site. Then for selecting and acquiring the disposal site at present, it is desired to carry out the selection of the site according to followings.

a. Economic bases

Internal economy of the sanitary landfill

- Availability of cover material in the site or in its vicinity
- Life of the site compatible with the infrastructure

Total economy of the solid wastes management system

- Rapid and secure access for the vehicles

Cost of the land

- Cost of acquisition or cost of renting

Resulting social costs and benefits

- Upward revaluation or devaluation of the vicinities
- Cost benefit during the work and with the ultimate use of the completed site

b. Sanitary basis

Climatic conditions

- Precipitation
- Evaporation
- Dominant wind

Soil

- Characterization and classification
- Probable permeability
- Ground water level

Superficial watercourses

- Flow direction
- Water use and required water quality

Topography

- Availability of cover material
- Capacity and life

c. Urban bases

Make compatible with the urban development

- Compatibility with land use plan
- Future use compatible with the urbanization
- Direction of urbanization towards the site
- Existing or planned paved roads

Make compatible with other urban systems

- There should be no possibility of polluting drinking waters
- Availability of electricity and telephone service
- Availability of sewage service