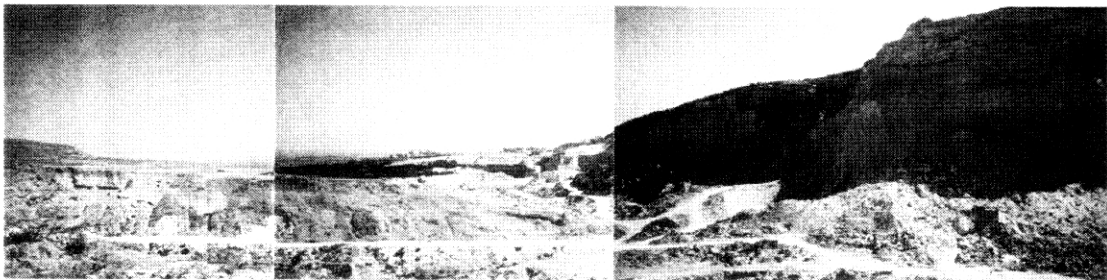


Cimsa Site

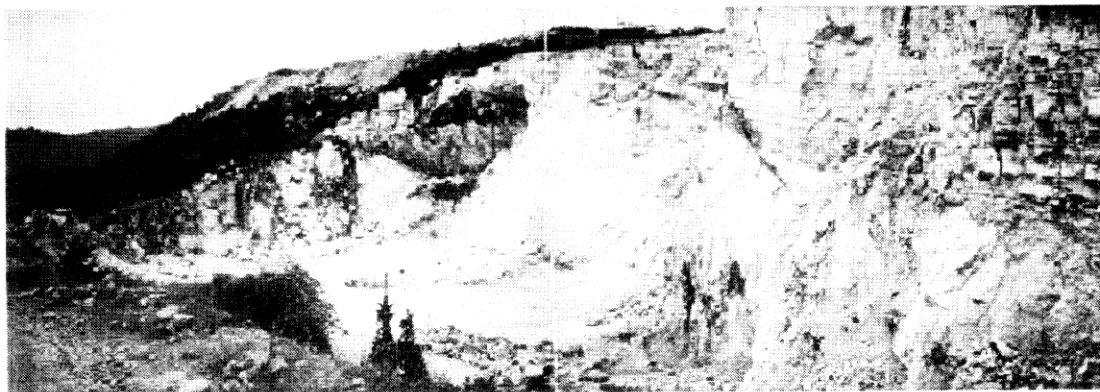


Quarry at Hebilli



Old Soda Quarry

Figure 14-50: Photographs of Candidate Disposal Sites for Mersin GM (1)



Old Cimsa Quarry



Quarry at Emirler

Figure 14-51: Photographs of Candidate Disposal Sites for Mersin GM (2)

a. CIMSAsite

The situation is described in detail in this EIA report.

b. Quarry at Hebilli

b.1 Location of Proposed Landfill Site

The proposed site is located at the village of Hebilli, 19km by road north of Mersin City Centre as shown in the enclosed map.

Road conditions from Mersin to the site can be described as follows:

- 8km main highway from the City Centre to Karacailyas
- 4km main road from Karacailyas
- 7km winding road that leads through many small villages. The road is presently being renovated.

b.2 Conditions of the Proposed Landfill Site

The village of Hebilli is located at a distance of approximately 300m from the eastern boundary of the site. The village is located on a higher elevation than the site. It will not be possible to hide landfill activities from the village.

Sand and limestone were excavated in the quarry. The quarry is no longer operated.

Due to the original topography of the site, the whole quarry can be filled up in accordance with the original landscape. The area of the quarry is provisionally estimated at 100ha. The site holds capacity for many years disposal from Mersin. Access to the bottom of the quarry is available. Soil for daily soil coverage of waste is easily available. Conditions regarding ownership have to be investigated.

The geological and hydrogeological conditions of the site have not yet been investigated.

b.3 Advantages and Disadvantages

Advantages and disadvantages for the proposed landfill site are summarised as follows.

b.3.1 Advantages

- The site holds capacity for many years disposal from Mersin.
- Access to the bottom of the quarry is available.
- Soil for daily soil coverage of waste is easily available.
- The site can be recovered in accordance with the original landscape.

b.3.2 Disadvantages

- The village Hebilli is located very close to the site. It will not be possible to hide landfill activities from the village.
- The road to the site leads through many villages.

b.4 Summary

In spite of the nearby village of Hebilli, and considering that the Provincial Governor may not approve the CIMSA-site, the proposed landfill site located in the quarry at the village of Hebilli is considered **feasible for further investigations**.

In fact, leaving out of account the nearby village, the site at Hebilli is considered much better for the future landfill of Mersin than the CIMSA-site.

c. Old Soda Quarry

c.1 Location of the Proposed Landfill Site

The proposed site is located 16km north the City Centre of Mersin. The location is shown in the enclosed map. The site is located next to a main road that carries a lot of traffic, especially in the summer time when people visit their summer houses in the mountains. It will not be possible to hide the landfill activities on this site.

The road to the site leads through a 6km narrow mountain road.

c.2 Conditions of the Proposed Landfill Site

The quarry holds capacity for only very few year's disposal from Mersin. No villages are located near the site. Access to the quarry is easily available.

c.3 Summary

The proposed landfill site called Old Soda Quarry is evaluated to be **infeasible** for the construction of the future landfill for Mersin Metropolitan Municipality. The main reasons are:

- The site is located next to a main road
- The proposed site does not hold enough capacity for the future landfill of Mersin to be constructed on this site.
- Due to the original very steep topography it will be very difficult to completely recover the site by the landfill operation.

d. Old CIMSA Quarry

d.1 Location of the Proposed Landfill Site

The proposed site is located not far from the village of Karapinar, approximately 19km by road north of Mersin City Centre as shown in the enclosed map. The road to the site leads through an 8km narrow mountain road that leads to other villages in the mountains.

The quarry is situated on both sides of the road. It will not be possible to hide the landfill activities from the road.

d.2 Conditions of the Proposed Landfill Site

The site was previously used by CIMSA who excavated limestone on the site. The quarry is no longer in operation. However, it is considered that the quarry does not hold enough capacity for the future landfill of Mersin. Access to the bottom of the quarry is easily available.

Since the ground consists of limestone, soil for daily coverage of waste is not easily available. No nearby residential areas are found.

d.3 Summary

The proposed landfill site called Old CIMSA Quarry is evaluated to be **infeasible** for the construction of the future landfill for Mersin Greater Municipality. The main reasons are:

- The proposed site does not hold enough capacity for the future landfill of Mersin. The quarry is located on both sides of a main road.
- Soil for daily soil coverage of waste is not easily available.
- Due to the original very steep topography of the site, it will be very difficult to completely recover the site by the landfill operation.

e. Quarry at Emirler

e.1 Location of the Proposed Landfill Site

The proposed site is located not far from the village of Emirler, approximately 15km by road north-west of Mersin City Centre as shown in the enclosed map. The last 5km of the road to the site is a narrow mountain road, however in good condition. At the bottom of the valley, approximately 1km from the site is a village with many green houses.

e.2 Conditions of the Proposed Landfill Site

The site is situated at the upper end of a valley. Since the bottom slope of the valley is rather steep, the site does not hold enough capacity for the future landfill of Mersin. Stones are excavated in mountain sides on both sides of the valley and are used for production of gravel. Since the ground mostly consist of rock, it will be difficult to find soil for daily coverage of waste. The quarry is in operation.

It will be very difficult to divert surface water from the upper part of the valley. It will be very expensive to construct and operate a landfill on this site.

e.3 Summary

The proposed landfill site not far from the village of Emirler is evaluated to be **infeasible** for the construction of the future landfill for Mersin Greater Municipality. The main reasons are:

- The proposed site does not hold enough capacity for the future landfill of Mersin.
- Soil for daily soil coverage of waste is not easily available.
- It will be very expensive to construct and operate a landfill on this site.

f. Conclusion

The above-mentioned evaluation is summarised in the table below.

Table 14-38: Evaluation of Candidate Final Disposal Sites for Mersin GM

Site Name	Current Conditions	Evaluation	Basis
1. CIMSA site	<ul style="list-style-type: none"> • 19 km from the centre of Mersin. • The abandoned quarry and about 150 ha of the area designated as future landfill in the Mersin M/P 	Feasible for further investigations.	<ul style="list-style-type: none"> • The site holds capacity for many years disposal from Mersin. • Daily covering soil is easily available. • It is an ideal site for final disposal because of landfill capacity, availability of covering soil, favourable surrounding land use, easy operation, etc. • The site can be recovered in accordance with the original landscape.
2. Quarry at Hebilli	<ul style="list-style-type: none"> • 19 km from the centre of Mersin. • The abandoned quarry of about 100 ha. 	Feasible for further investigations.	<ul style="list-style-type: none"> • The site holds capacity for many years disposal from Mersin. • Daily covering soil is easily available. • It is a suitable site for final disposal because of landfill capacity, availability of covering soil, easy operation, etc. However, the site is very close to the village Hebilli. • The site can be recovered in accordance with the original landscape.

Site Name	Current Conditions	Evaluation	Basis
3. Old Soda quarry	<ul style="list-style-type: none"> • 16 km from the centre of Mersin. • The abandoned quarry of less than 10 ha. 	Not feasible.	<ul style="list-style-type: none"> • The site is located next to a trunk road. • The site does not hold enough capacity for future landfill of Mersin. • Due to the originally very steep topography it will be very difficult to completely recover the site by the landfill operation.
4. Old CIMSA quarry	<ul style="list-style-type: none"> • 19 km from the centre of Mersin. • The abandoned quarry of about 10 ha. 	Not feasible.	<ul style="list-style-type: none"> • The site does not hold enough capacity for future landfill of Mersin. • A trunk road is located at the centre of the site. • Covering soil would not be easily available. • Due to the originally very steep topography it will be very difficult to completely recover the site by the landfill operation.
5. Quarry at Emirler	<ul style="list-style-type: none"> • 15 km from the centre of Mersin. 	Not feasible.	<ul style="list-style-type: none"> • The site does not hold enough capacity for future landfill of Mersin. • Covering soil would not be easily available. • The cost of construction/operation is very expensive due to the construction of the embankments and access road. • Due to the originally very steep topography it will be very difficult to completely recover the site by the landfill operation.

Based on the results of the evaluation, the Team recommended the following sites for the construction of the future landfill for the Greater Municipality of Mersin:

- The site located in the CIMSA-excavation area
- The site located at the village of Hebilli

Regarding the site located at the village of Hebilli the C/P identified very difficult to obtain consensus from people living in the village to use the site for a landfill.

The Cimsa site was selected as a future final disposal site by the C/P and Mersin GM as agreed on the M/M on the IT/R. Consequently the team commenced field investigations for the conduct of the F/S of the construction of the new landfill from February 1999.

14.7 Monitoring Program

14.7.1 Landfill

The waste dumped from collection vehicles is flattened, compacted by a bulldozer and covered with soil every day at the operation stage. As inflammable gases are removed through the ventilation system, there is little opportunity of landfill fire. Furthermore, fire extinguishers, a water tank for extinguishing fire and a water spray truck should be equipped at the disposal site. The operator of bulldozer and relevant workers will be responsible for extinguishing the landfill fires. In an emergency it is possible to use the leachate in the regulation pond for extinguishing the landfill fire.

There is no need of monitoring after the termination of operation.

14.7.2 Gas Removal

At every phase site vertical and horizontal facilities for gas removal system are installed. The gas generated at the disposal site is inflammable methane. Since the gas is dispersed in the open air through pipes, there is little possibility of explosion. The bulldozer driver or relevant workers should monitor sometimes whether the gas is flowing out or not from the ventilation system. If the gas is not sensed, the cause should be thoroughly investigated.

At the stage of aftercare it is necessary to pay attention to monitoring of gas generation until it is determined that landfill gas emission is negligible. The gas should be detected by equipment at least once a year.

14.7.3 Offensive Odour

Offensive odour is produced mainly from the decomposition of organic matter. Therefore, it is most important to cover the waste with soil and let anaerobic decomposition promote under the soil in order to prevent the dispersion of offensive odour. As the waste is compacted at first on the site and covered with soil at the end of the day, daily soil cover must be observed necessarily without failure. The manager of the disposal site should inspect the situation of soil cover and direct the workers to cover the waste with soil completely, if not covered.

Since the compost plant is introduced in this project and compostable waste (organic waste) is transported not to the disposal site but to the compost plant separately, it is expected that most of the waste hauled to the disposal site is not organic and productivity of offensive odour is low.

Offensive odour from compost plant may give an impact to the surrounding area. Therefore, the monitoring of odour should be conducted once a month.

14.7.4 Leachate

At the stage of operation the leachate should be inspected regularly twice a year. The items of water quality analysis should be decided according to Water Pollution Control Regulation. However, the number of the items can be decreased because the standards are prepared for discharging and the leachate is not discharged out of the site after the second year of operation. For example, BOD and COD may be enough.

Leachate will continue to be produced after the termination of waste disposal although production rate and strength will diminish with time. Therefore, the leachate should be inspected continuously once a year at the stage of aftercare.

In order to monitor the possibility of pollution of groundwater, three monitoring wells should be prepared downstream of the site. Three wells W2, W3, and W4, where the water quality analysis was already carried out to know the present situation, are suitable for monitoring of groundwater pollution. Inspection should be carried out once a year.

The leachate is not discharged from the medical waste disposal site and circulated in the site. Although there is no possibility of groundwater pollution by medical waste, the quality of leachate and groundwater should be monitored, preparing for the worst. The monitoring program for ten years shall be prepared according to the Regulation

on Control of Medical Waste. The leachate should be inspected twice a year during operation and once a year after the termination of operation, because the medical disposal site is covered with impermeable sheet at the stage of aftercare and the productivity of leachate is reduced rapidly.

To monitor the impact on the groundwater by medical waste, the inspection of three wells described above should be substituted.

14.8 Conclusion

The existing dumping site in Mersin has been giving many kinds of impacts on the surrounding environment, like water pollution due to the leachate, air pollution due to landfill fire and nuisance of offensive odour, etc. The implementation of this project terminates the dumping of waste and the environment is improved greatly in the surrounding area.

The intermediate treatment facilities like sorting plant and compost plant is to be introduced and the waste is recycled and reused effectively as resources in this project. The positive impact on the economic activities is expected. Negative impact from these plants like offensive odour, waste water and noise will be negligible because the mitigation measures are taken.

At the bottom of the disposal site the impermeable clay layer is to be kept as the liner to prevent the leachate going into the underground. Although the leachate is treated and discharged outside obeying the Water Pollution Control Regulation in the first year, it will be collected in the regulation pond and circulated in the site after then. Negative impact is expected to be negligible.

The outbreak of landfill fires and offensive odour can be controlled by the sanitary landfill. The waste is flattened, compacted and covered with soil every day at the disposal site. Negative impact is negligible.

The medical waste disposal site is to be constructed separately from the municipal waste disposal site. The waste is disposed of according to the sanitary landfill system stipulated in the Medical Waste Control Regulation of the MoE and leachate is circulated in the site. The daily management is strictly controlled.

The monitoring of environmental impact is to be conducted for control of water pollution and air pollution. The quality of groundwater and the quantity of gas will be monitored during operation and aftercare period.

Based on the result of careful examination on (1)the project, (2)existing situation of environment, (3)the impact on the environment by the implementation of the project, (4)measures to mitigate the impact, and (5)monitoring programs during operation and after termination of the operation, it is expected that the negative impact on the environment can be controlled to be negligible.