1. The 8-unit plant operating at 100 percent capability (1,400,000 kw) and burning coal at the rate of 0.83 pound per kwh would consume 14,000 tons of coal each 24 hours.
2. The average coal car presently in use is about 40 feet long between couplings and has a capacity of 50 tons. It would require 280 such cars per day to furnish the 14,000 tons of coal burned.
3. To offset irregularities in the delivery of coal and to provide for the building of the coal-storage pile, it was deemed necessary that the interchange yards should have a capacity of 2 days consumption, the loaded car yard 3 days, and the empty car yard 2½ days.

The nearest rail point to the plant is at Emory Gap, about 6 miles from the plant site; this point is served by both the Tennessee Central Railroad and the Southern Railway. As a result of negotiations with these railroads, TVA constructed one interchange yard at Caney Creek to handle cars arriving over the Tennessee Central Railroad, and the Southern Railway built another interchange yard along its line at Emory Gap. The railroads deliver the loaded cars and pick up the empty cars at these yards, and TVA does all the hauling between the interchange yards and the plant.

At the plant site, in addition to the storage yards and access tracks through the hopper buildings between the yards, there is a return track from the empty yard along the loaded yard and back to the access railroad. The track system at the plant is shown in exhibit 1, and the locality map on this exhibit shows the interchange yards and the access railroad.

All tracks were constructed with new 90-pound ARA type A rail, and turnouts are No. 8 with solid manganese steel self-guarded frogs. All multiple tracks are 14 feet on centers. The ballast consists of crushed blast furnace slag applied at the rate of 0.5 cu yd per foot of single track. Crossties of creosoted hardwood, 7 inches by 9 inches by 8 feet 6 inches, were used at the rate of 22 for each 39 feet of track on the main traffic line, and 6 inches by 8 inches by 8 feet 6 inches at the rate of 20 per 39 feet on all other tracks.

The total amount of track constructed for the project was:

	Miles
Interchange yard	3.1
Access railroad	5.9
Loaded car yard	9.2
Empty car yard	8.5
Hopper and return track	2.7
Plant tracks	1.2
Total	30.6

Delivery

Interchange yards—The location finally selected is in the Caney Creek Valley near Emory Gap and approximately 0.4 mile from an existing spur on the Tennessee Central Railroad. The yard was originally designed for an ultimate capacity of about 572 cars, but before the track was laid, authorization of additional units made it necessary to make arrangements also to receive coal from the Southern Railway. Since the Southern chose to install their own facilities for interchange, the contemplated track capacity of the Caney Creek interchange yard was reduced to 254 cars.

The connection to the Southern's interchange yard was made by running a track from TVA's interchange yard in a westerly direction for about 0.7 mile to the Southern's main line.

Loaded yard—The loaded yard consists of 21 tracks with a total length of 48,790 linear feet and provides storage for 854 cars. The original design provided for the construction of sufficient additional tracks to increase the capacity of the yard to 948 cars if required. The yard covers an area of slightly more than 15 acres, and since, for operational purposes, this area is very flat it was necessary to provide an extensive drainage system. The subgrade is corrugated longitudinally with troughs on 28-foot centers, or between every other track. At intervals of about 300 feet concrete catch basins were placed in these troughs and connected transversely with 18-inch concrete pipes which carry the drainage from the yard. The catch basins are covered with cast-iron "beehive" grates, and the ballast is shaped to these grates so as to provide for both open drainage and percolation.

The loaded cars are brought from the loaded yard to the two hopper buildings over a system of tracks which provides for the cars from the eastern half of the yard to pass over the track scales and for all cars to pass through the hopper buildings on either of three tracks.

Empty yard—After the coal cars have been unloaded in the hoppers, they are pushed forward to the humps which are located immediately south of the hoppers. The humps drop the cars 6 feet in a distance of 150 feet and will, even under adverse weather conditions, carry the cars well toward the far end of the yard where a sharp upgrade keeps the cars from overrunning the storage tracks. Since the yard was designed to operate by gravity under adverse weather conditions, during favorable weather the speed of the cars tended to be excessive. After obtaining some operating experience, automatic car retarders were installed at the entrance to the yard, and, through controls located at the hopper buildings, this retarder can be set to control cars over a wide range of speeds.

The empty yard consists of 22 tracks, measuring 44,944 linear feet, and provides a normal storage for 715 cars. In an emergency this can be increased to 770 cars by pushing the cars forward to the clearance points. The drainage system within the yard is similar to that described for the loaded yard.

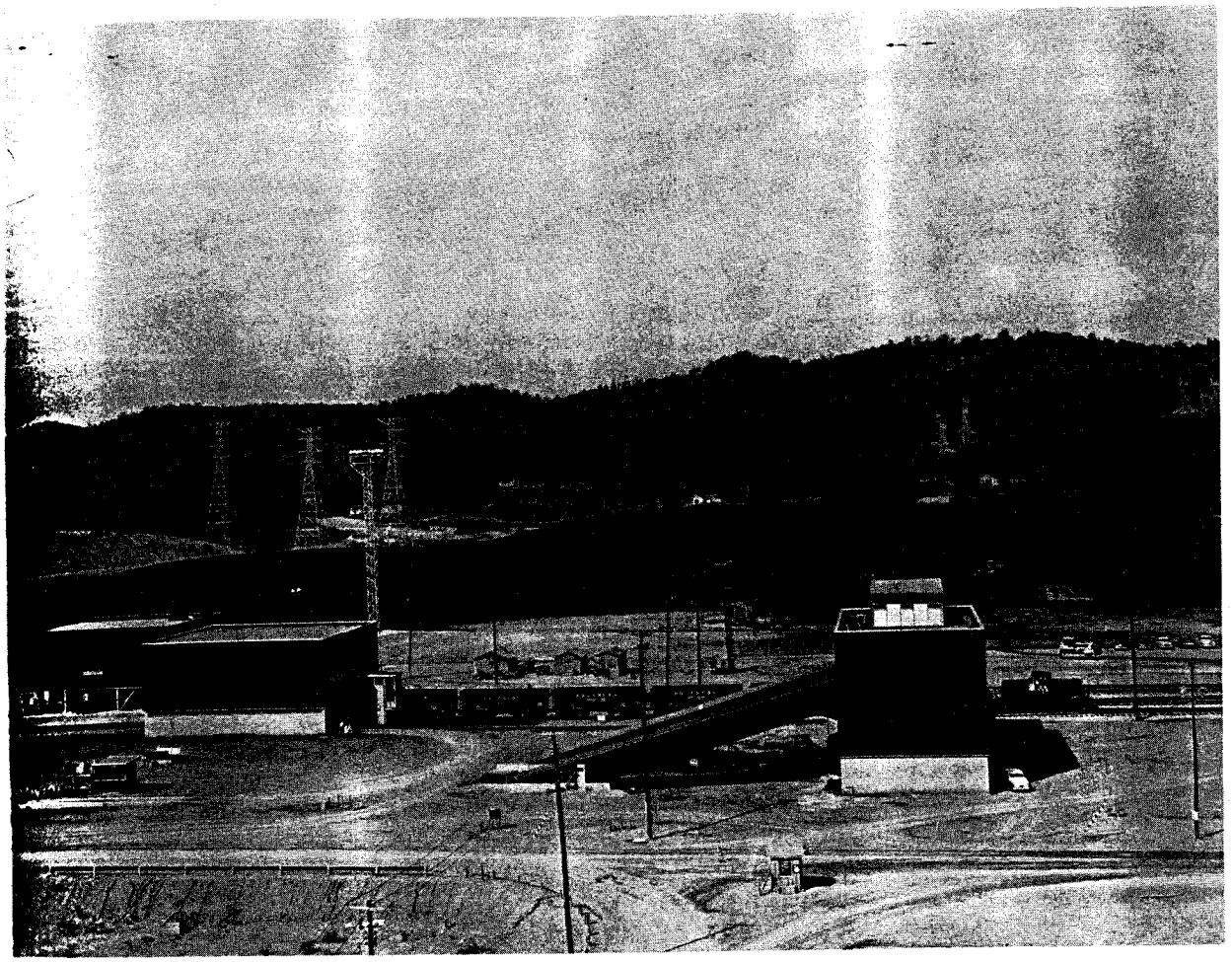

FIGURE 60.—*An over-all view of the coal handling facilities showing the 90-day storage area of 1,350,000-ton capacity. Coal hopper buildings Nos. 1 and 2 are shown at left, each containing rotary rail car dumpers with No. 2 to the right also containing truck unloading facilities. The then incompleted truck scales and sampling building are shown at lower left; the crusher building with control penthouse is shown at right with stocking out conveyor extending beyond.*

Railroad- and truck-received coal	Total capacities
Receiving hoppers (surcharged 30 degrees—total all hoppers)	124 tons
4 vibrating feeders	2000 tph
2 rotary car dumpers	40 cars per hour
2 belt conveyors	2000 tph
Crusher building	
4 vibrating screens	2000 tph
4 crushing units	2000 tph
Conveying to bunkers	
2 inclined belt conveyors	2000 tph
2 horizontal belt conveyors	2000 tph
2 belt trippers	2000 tph
Conveying to storage	
1 inclined belt conveyor	1000 tph
Reclaiming from storage	
2 sets of vibrating feeders	2000 tph
2 belt conveyors	2000 tph

No facilities were designed at this plant for receiving coal by barge shipment. General rail and truck facilities are shown in exhibit 1 and the general conveyor system is shown in exhibit 4.

RAIL AND TRUCK UNLOADING FACILITIES

It was anticipated that at Kingston the major portion of the coal would be delivered by rail and that considerable truck delivery could also be expected. Therefore, the design and planning provided for both types of delivery on a large scale. Pending the development of delivery by truck, adequate rail facilities were installed to provide for the total requirements of units 1-8. When the ninth unit was added the rate of truck delivery had progressed sufficiently that the original rail facilities were still considered adequate.

The following assumptions were used for establishing the capacity of the rail system: