

University of Mississippi

eGrove

Open-File Reports

Mississippi Mineral Resources Institute

1985

The Economic Feasibility of Marketing Mississippi Gravel in Beaumont, Texas

S. Cabell Shull

Follow this and additional works at: https://egrove.olemiss.edu/mmri_ofr

Recommended Citation

Shull, S. Cabell, "The Economic Feasibility of Marketing Mississippi Gravel in Beaumont, Texas" (1985).
Open-File Reports. 98.
https://egrove.olemiss.edu/mmri_ofr/98

This Report is brought to you for free and open access by the Mississippi Mineral Resources Institute at eGrove. It has been accepted for inclusion in Open-File Reports by an authorized administrator of eGrove. For more information, please contact egrove@olemiss.edu.

Open-File Report 85-9

The Economic Feasibility of Marketing Mississippi Gravel in Beaumont, Texas

S. Cabell Shull

1985

The Mississippi Mineral Resources Institute
University, Mississippi 38677

THE ECONOMIC FEASIBILITY OF MARKETING
MISSISSIPPI GRAVEL IN BEAUMONT, TEXAS

S. Cabell Shull, Ph.D.
Minerals Commercialization Center

The Mississippi Mineral Resources Institute
University, Mississippi 38677

1985

THE ECONOMIC FEASIBILITY OF MARKETING MISSISSIPPI GRAVEL IN BEAUMONT, TEXAS

I. Introduction

The purpose of this study is to investigate the feasibility of a contemplated commercial project to ship aggregate from gravel pits located in Wilkinson County Mississippi to a more favorable market in Beaumont, Texas. The proposed shipping route would be by barge and would utilize both the Mississippi River and the Intercoastal Waterway (see Figure 1). Short trips by truck would also be necessary to transport the gravel from the pits located approximately eight miles from the Mississippi River and again, upon unloading at Beaumont, to nearby storage facilities. The total distance in transit would be approximately 280 miles by water and 5 to 8 miles by land. Despite the distances involved, the project could be profitable if gravel prices in the Beaumont area remain at the present \$14.50 per ton level.

II. Background Information for the Project

Normally, markets for gravel tend to be highly localized because of transportation costs which can become prohibitive if the primary mode of transportation is trucking by land. For example, shipping prices in Mississippi average about 10 cents per ton mile for a short haul and 8 cents per ton mile for a long haul. Local custom usually delineates a trip of 20 miles or less as a short haul while those of greater distances are long hauls. By contrast, trucking costs in Texas appear to be approximately 6 cents per ton mile regardless of the shipping distance. Lower fuel costs in Texas account for most of the differences in costs

between the two states. Another possible explanation for the cost differential between Mississippi and Texas is the fact that the Texas highway system, including county roads, is more extensively developed and maintained, which gives the Texas shipper a competitive advantage.

Besides transportation costs, the other major cost to the gravel producer is the mining cost which results from the removal of the gravel from the pit. The major factor affecting mining costs is the amount of overburden or soil that must be removed in order to reach the gravel. The greater the amount of overburden, the more costly it is to extract the gravel. The Dallas, Texas market area represents an ideal situation for local gravel producers in minimizing the removal costs. Dallas is apparently surrounded by dried-up creek and river bottoms which contain gravel pits with little or no overburden. When a local contractor has a job requiring gravel, he merely selects a pit that is close to the job, removes the gravel, and transports it by truck to the required site. For this reason, gravel prices in Dallas, Texas are approximately \$8.00 to \$9.00 per ton delivered to the job site.

In addition to the shipping and the overburden removal costs, other costs exist such as washing and sizing the gravel, royalties to the land owner, and reclamation costs, if any, after the pit is abandoned. The total of these costs, exclusive of transportation costs, to the owners of the gravel pits is approximately \$8.00 per ton. Included in this cost, as is consistent with sound economic theory, is an amount which would

give the producer an economic profit or a return on his investment.

As discussed earlier, gravel markets tend to be highly localized due to transportation costs. For example, a relatively short haul of 10 miles in Mississippi would add about \$1.00 per ton to the price of gravel while a longer haul of 100 miles would add \$8.00 per ton to its costs. Using the F.O.B. cost per ton of the Wilkinson County gravel pit, gravel could be sold locally for about \$9.00 per ton; however, a price of \$16.00 per ton would be required to return the same profit if shipping by truck to a market located 100 miles away. This illustrates the advantages of local producers and the barriers that exist to prevent more distant producers from penetrating these markets. Even though a certain producer may be more efficient at mining his gravel, land shipping costs will quickly eliminate such mining advantages.

III. The Beaumont, Texas Gravel Market

The market for gravel in the Beaumont area appears to be unique in that the price of gravel has been historically and is presently higher than the Texas average. The latest survey indicates that the prevailing price for that market is \$14.50 per ton. For comparison, gravel prices in the Houston area, which is only about 80 miles away, range from \$12.00 to \$13.00 per ton, and gravel prices in the Dallas area are between \$8.00 and \$9.00 per ton. The price discrepancies are somewhat puzzling but can be explained by analyzing transportation costs.

The competitive pit price for Texas gravel producers is about \$8.00 per ton. This is about the same price that prevails

for on-site pit prices in Wilkinson County Mississippi. Any additional cost which must be added to the pit price will primarily be due to costs incurred in transporting the gravel from the pit to the site where the gravel is required. As previously mentioned, Dallas represents the ideal situation for gravel users because gravel sites are located throughout the city and transportation costs are minimal. Therefore, the prevailing price for gravel in Dallas is between \$8.00 and \$9.00 which is very close to the pit price.

Gravel users in Houston are not so fortunate. The closest gravel pits to the Houston area are located 40 miles away in Dayton, Texas. However, as will be discussed later, Houston gravel users bypass this source and obtain their gravel from El Campo and Columbus, which are located approximately 80 miles away. When this transportation cost is added to the pit price, the gravel price in the Houston area becomes between \$12.00 and 13.00 per ton.

At this point, two logical questions may arise: (1) why don't the El Campo/Columbus producers sell at the higher prices to Beaumont, and (2) why don't Houston buyers buy from the closer Dayton pits. The first question can again be analyzed by considering the transportation costs. To reach Beaumont, the El Campo/Columbus producers would have to ship their gravel an additional 100 miles by truck. At 6 cents per ton mile, this would add another \$6.00 per ton to the cost of gravel and would require charging \$18.00 to \$19.00 per ton to deliver to the

Beaumont area. Clearly these producers cannot meet the local price of \$14.50 per ton.

The answer to the second question, as to why Houston producers bypass the closer Dayton pits, is slightly more complex. Instead of serving the Houston market, the Dayton producers are presently serving the Beaumont area at \$14.50 per ton. Since Dayton is located midway between Houston and Beaumont, approximately 40 miles from each, transportation costs at 6 cents per ton mile into either the Houston or Beaumont market is about \$2.40 per ton. When this amount is subtracted from the \$14.50 per ton price in Beaumont, it gives the Dayton pit producers a price of \$12.10 per ton, or about \$4.10 more than the Texas average pit price of \$8.00 per ton. Therefore, there is no incentive for them to sell in the more competitive Houston market at the lower price of \$12.00 to \$13.00 per ton. Likewise, the Dayton producers have no incentive to lower their pit price, since they can sell all of their output to Beaumont. Houston users are forced to by-pass the Dayton source and seek more distant sources who will sell at competitive prices. Gravel prices are therefore higher in the Beaumont area because of the existence of noncompetitive producers.

These noncompetitive suppliers are probably maintained in the Beaumont area because of the lack of other gravel sources in the immediate vicinity. To illustrate, prior to the utilization of the Dayton pits, several local buyers of gravel used deposits located in Louisiana. At least one of these buyers expressed a fear that these Louisiana deposits would be depleted in four to

five years. Presently, the Beaumont buyers are no longer utilizing the Louisiana pits, but are relying on the Dayton pits instead. According to these local buyers, four factors influence their decision to use a particular supplier: an adequate supply, reliability, financial stability, and a quality product.

Presumably the Dayton operators were able to use these factors to undercut the Louisiana suppliers and to take over their share of the Beaumont market.

IV. The Proposed Marketing Plan

In order to profit from the higher prices for gravel in the Beaumont area, producers of gravel near Woodville in Wilkinson County Mississippi propose to take advantage of the availability of cheaper water transportation by shipping Mississippi gravel to Beaumont by water. Compared to shipping by truck, transport of bulk products by waterway is much more price and energy efficient. For example, a shipping rate of 8 mills per ton mile along waterways is possible as compared with 8 cents per ton mile by truck. Barging is therefore approximately 10 times more cost efficient for a comparable distance than trucking. Using these figures, it would be possible to ship gravel from Woodville, Mississippi to Beaumont via the Mississippi River and Intercoastal Waterway for \$2.25 to \$3.00 per ton. Adding these costs to the basic pit mining price of \$8.00 per ton F.O.B. Woodville yields a total cost of \$12.50 to \$13.00 per ton for Mississippi gravel delivered to Beaumont. As long as the Beaumont price exceeds \$13.00 per ton, the proposed

plan is on its face feasible. However, other factors must be taken into account.

V. The Feasibility of Shipping Mississippi Gravel to Beaumont, Texas

One factor that must be considered in assessing the feasibility of selling Mississippi gravel in Beaumont is the need to construct or rent an appropriate unloading and storage facility. Since it would be necessary to maintain a reserve of gravel for contingency purposes, such storage costs cannot be ignored. It is estimated that a dock could be rented in the Beaumont area for \$250,000 per year and a barge load of gravel could be stored for \$50.00 per day. This introduces a considerable level of fixed costs into the project. Simple break even analysis reveals that, at a selling price of \$14.50 and variable costs of \$13.00 per ton, it would be necessary to sell 167,000 tons of gravel a year just to break even. Based on a total estimated annual demand of one million tons of gravel for the Beaumont market, it would therefore be necessary for the Mississippi suppliers to capture at least 17 percent of the market. Faced with the loss of such a sizable share of the market, local gravel suppliers may retaliate.

Such retaliation would likely take the form of a price reduction by the operators of the Dayton gravel pits. Because of the existence of higher fixed costs, the Mississippi producers may find it difficult to engage in a price war against local pit operators. Since gravel is essentially a fungible product, contractors and other users may be very sensitive to price differentials of only a few cents. Therefore , a risk exists for

the proposed project that price cutting by local operators will prevent any significant market penetration by the Mississippi producers.

Another risk that the project faces is the possibility of a price decrease of gravel in the Beaumont area. Such a price decrease could result from one or a combination of several market forces. First, there could be an overall price decrease throughout the state of Texas. Secondly, competitive prices could force Beaumont prices down to a level consistent with present gravel prices in the state. Finally, there exists the possibility that, due to a recession in the local economy, pricing could drop only in the Beaumont area.

Although recent market history indicates that Texas was one of the few states which exhibited a strong demand for gravel, statewide prices have declined twice in the decade between 1973 and 1983. In 1973 prices dropped approximately 2 percent, while in 1976 the price of gravel dropped an average of nearly 10 percent. Although economic conditions at the present time may be different from those during the price decreases, it is well to note that such overall price decreases are possible, particularly in response to a decline in economic activity throughout the United States .

That competitive pressures may force Beaumont prices downward to a level consistent with other pits throughout the state is also a possibility. It appears that noncompetitive forces keep Dayton prices approximately \$4.00 higher than that of other pit operators who serve large metropolitan areas such as

Dallas and Houston. Such a price differential may attract other nearby producers to attempt to enter the Dayton market. The ensuing increase in supply could force prices downward, perhaps to as low as \$10.00 to \$12.00 per ton. At such a price, Mississippi producers would find it difficult to compete.

A third possibility of a price decrease could result from a decrease in demand. It is estimated that approximately one million tons of gravel are used per year in the Beaumont area. However, the local economy is closely tied to the oil industry which is presently in a decline. As a result, the economy of Beaumont cannot be expected to be as strong as other Texas cities such as Austin and San Antonio, whose economies are more diverse. A recession or even a slight decrease in construction could force gravel prices downward.

VI. Recommendations

At present price levels of \$14.50 per ton, the proposed project appears to be profitable. However, because of the great distance involved and the rather high fixed costs, the project involves some risk. A price reduction of Beaumont gravel may be difficult to offset by a corresponding cost decrease on the part of Mississippi operators, and a reduction in profits per ton would be the consequence. In a worse case scenario, local producers may assume the Mississippi operators have a small profit margin and attempt to set prices low enough to force their withdrawal. If, however, the demand for gravel is strong enough to accommodate both local and Mississippi producers, then the proposed project would have a strong probability of success.

It is therefore recommended that the project be undertaken with caution. Mississippi producers should not attempt any action which would result in a price war nor should they attempt to undercut local producers. Cooperation with local users will be highly desirable to insure both short-term survival and long-term profitability.

Other markets that may broaden the Mississippi gravel export base are Lake Charles and New Orleans. Distances to these markets would be less than to Beaumont and these cities may also be reached by water transport. The lower mileages involved in transporting gravel to these cities would reduce the shippers' freight costs and their vulnerability to price swings. In conclusion, despite the mentioned risks in entering the Beaumont gravel market the data available suggests that given a moderately strong Beaumont economy Mississippi gravel should compete successfully with gravel from other sources.

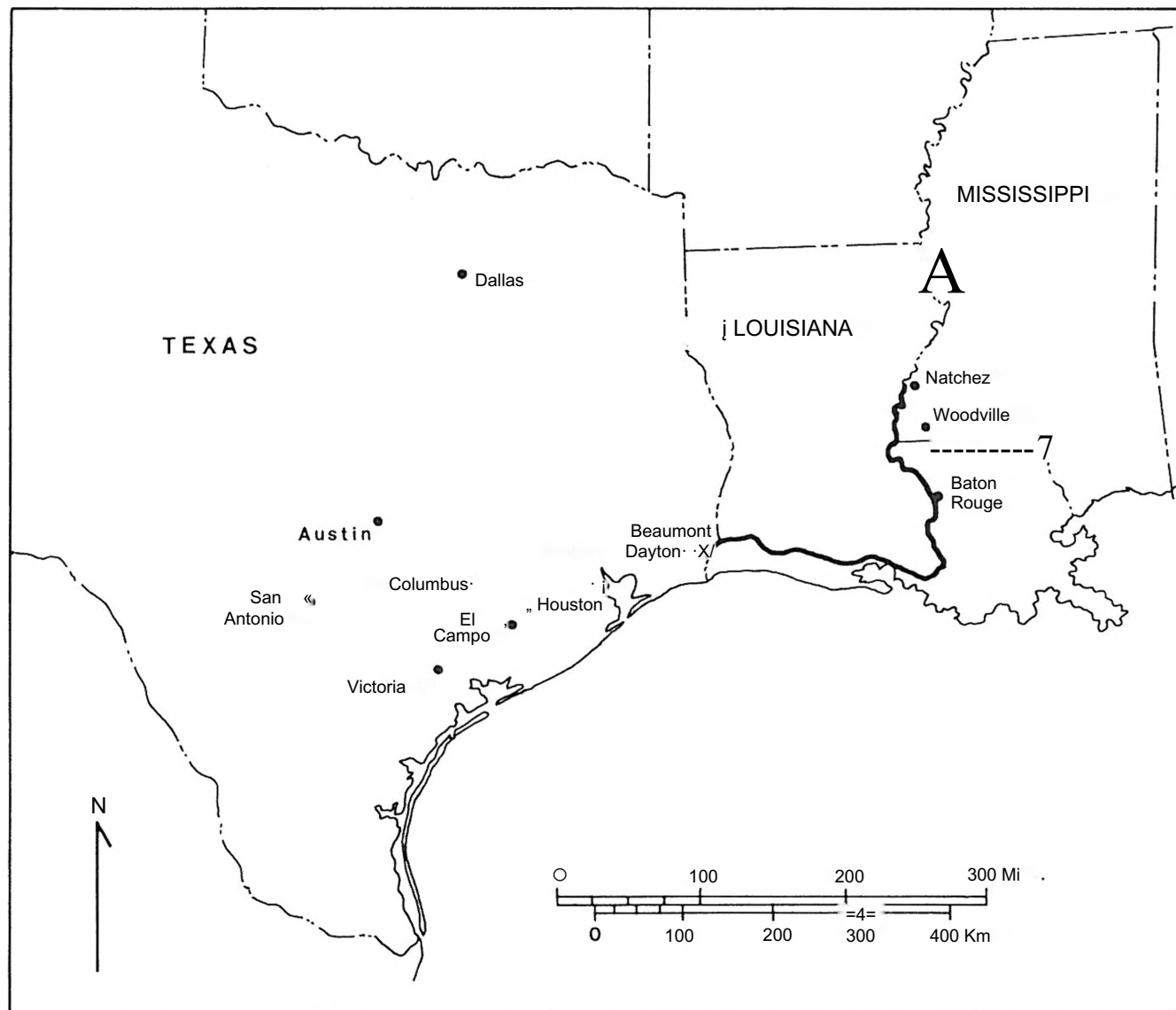


FIGURE 1 : PROPOSED SHIPPING ROUTE