

October 26, 1977

United States Geological Survey
P.O. Box 1809
Durango, Colorado 81301

Attention: Mr. Jerry Long

Dear Sir:

Supra Energy Corporation proposes to drill the Jicarilla "X" No. 13 well located 1715 feet from the South line and 1000 feet from the East line of Section 15, Township 26 North, Range 4 West, N.M.P.M., Rio Arriba County, New Mexico.

The following attachments are included with this application:

1. Map of existing roads.
2. Planned access road which is approximately 2100 feet long.
3. Location of existing wells.
4. Lateral roads to well locations.
5. Location of surface equipment, if required.
6. Drilling and completion water will be obtained from the Supra Energy Corporation water well located in the SW 1/4 of Sec. 23, T-26N, R-4W, N.M.P.M., Rio Arriba County, New Mexico.
7. Waste will be disposed of by being placed in the reserve pit and buried upon completion of the well.
8. There will be no camp at or near the well site.
9. There will be no air strip.
10. A plat is attached showing the location of the rig, mud tanks, reserve pit, burn pit and ect.
11. A letter of Certification is attached and the operators representative is Rudy B. Motte, Area Superintendent, P.O. Box 808, Farmington, New Mexico. Phone: Area Code 505 - 325-3587.
12. After the well is completed the location will be cleaned up and bladed. The reserve pit will be fenced until it has dried and then the pit will be restored to its' natural state.
13. The soil is sandy loam with the principal vegetation being Pinon and Juniper.

1. *Introduction*

During the last decade, the number of publications on the
topic of "multidimensional scaling" has increased rapidly.
In this paper we shall review some of the more important
of these.

2. *Some Definitions*

Let $X = \{x_1, x_2, \dots, x_n\}$ be a set of n objects, and let d_{ij} be the distance between x_i and x_j . A $n \times n$ matrix $D = [d_{ij}]$ is called a dissimilarity matrix if it satisfies the conditions:

(1) $d_{ii} = 0$ for all i , and $d_{ij} > 0$ for all $i \neq j$.

(2) $d_{ij} = d_{ji}$ for all i, j .

(3) $d_{ij} \leq d_{ik} + d_{kj}$ for all i, j, k .

It is clear that the elements of D are non-negative real numbers. If the d_{ij} 's represent the distances between x_i and x_j in a metric space, then D is called a metric dissimilarity matrix. If the d_{ij} 's represent the dissimilarities between x_i and x_j in a non-metric space, then D is called a non-metric dissimilarity matrix.

Given a dissimilarity matrix D , we can always find a metric dissimilarity matrix D' such that $D' \leq D$. This is done by the following procedure:

Let $D' = [d'_{ij}]$ be a $n \times n$ matrix defined by

$$d'_{ij} = \min_{k \neq i, j} \{d_{ik} + d_{kj}\} \quad (1)$$

Then it is easily seen that $D' \leq D$. Moreover, if D is a metric dissimilarity matrix, then D' is also a metric dissimilarity matrix.

Given a dissimilarity matrix D , we can always find a non-metric dissimilarity matrix D' such that $D' \leq D$. This is done by the following procedure:

Let $D' = [d'_{ij}]$ be a $n \times n$ matrix defined by

$$d'_{ij} = \max_{k \neq i, j} \{d_{ik} + d_{kj}\} \quad (2)$$

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Given a dissimilarity matrix D , we can always find a metric dissimilarity matrix D' such that $D' \leq D$. This is done by the following procedure:

Let $D' = [d'_{ij}]$ be a $n \times n$ matrix defined by

$$d'_{ij} = \frac{1}{2} \{d_{ij} + \min_{k \neq i, j} \{d_{ik} + d_{kj}\}\} \quad (3)$$

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