

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

May 20, 1969

**Resler and Sheldon
314 Carper Building
Artesia, New Mexico 88210**

Gentlemen:

Enclosed herewith please find Administrative Order No. SWD-102 for your Steeler Well No. 1 located in Unit I of Section 20, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico, to permit the injection of salt water for disposal purposes into the Grayburg formation at approximately 3681 feet to approximately 3689 feet through 2-inch EUE tubing with a packer set at approximately 3670 feet.

Very truly yours,

**A. L. PORTER, Jr.
Secretary-Director**

ALP/JEK/og

cc: Oil Conservation Commission - Hobbs
Oil & Gas Engineering Committee - Hobbs

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SUBJECT: SALT WATER DISPOSAL WELL

ORDER NO. SWD-102

THE APPLICATION OF RESLER AND SHELDON
FOR A SALT WATER DISPOSAL WELL.

ADMINISTRATIVE ORDER
OF THE OIL CONSERVATION COMMISSION

Under the provisions of Rule 701 (C) Resler and Sheldon, made application to the New Mexico Oil Conservation Commission on May 5, 1969, for permission to complete for salt water disposal its Steeler Well No. 1 located in Unit I of Section 20, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico.

The Secretary-Director finds:

1. That application has been duly filed under the provisions of Rule 701 (C) of the Commission Rules and Regulations;
2. That satisfactory information has been provided that all offset operators, surface owners, and the New Mexico State Engineer Office have been duly notified; and
3. That the applicant has presented satisfactory evidence that all requirements prescribed in Rule 701 (C) will be met.
4. That no objections have been received within the waiting period prescribed by said rule.

IT IS THEREFORE ORDERED:

That the applicant herein, Resler and Sheldon, is hereby authorized to complete its Steeler Well No. 1 located in Unit I of Section 20, Township 23 South, Range 37 East, NMPM, Lea County, New Mexico, in such a manner as to permit the injection of salt water for disposal purposes into the Grayburg formation at approximately 3681 feet to approximately 3689 feet through 2-inch EUE tubing with a packer set at approximately 3670 feet.

IT IS FURTHER ORDERED:

That jurisdiction of this cause is hereby retained by the Commission for such further order or orders as may seem necessary or convenient for the prevention of waste and/or protection of correlative rights; upon failure of applicant to comply with any requirement of this order after notice and hearing, the Commission may terminate the authority hereby granted in the interest of conservation. That applicant shall submit monthly reports of the disposal operation in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

APPROVED at Santa Fe, New Mexico, on this 20th day of May, 1969.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



A. L. PORTER, Jr.
Secretary-Director

SEAL

Mathematical Induction

1. Base Case

2. Inductive Step

(1)

Let $P(n)$ be the statement that $1 + 2 + \dots + n = \frac{n(n+1)}{2}$. We will prove that $P(n)$ is true for all $n \in \mathbb{N}$ by mathematical induction.

Base Case: $n = 1$. $1 = \frac{1(1+1)}{2} = 1$. True.

Inductive Step: Assume $P(k)$ is true for some $k \in \mathbb{N}$. We need to show $P(k+1)$ is true.

$1 + 2 + \dots + k + (k+1) = \frac{k(k+1)}{2} + (k+1) = \frac{k(k+1) + 2(k+1)}{2} = \frac{(k+1)(k+2)}{2}$

Therefore, $P(k+1)$ is true. By induction, $P(n)$ is true for all $n \in \mathbb{N}$.

Let $P(n)$ be the statement that $2^n > n^2$. We will prove that $P(n)$ is true for all $n \geq 5$ by mathematical induction.

Base Case: $n = 5$. $2^5 = 32 > 25 = 5^2$. True.

Inductive Step: Assume $P(k)$ is true for some $k \geq 5$. We need to show $P(k+1)$ is true. $2^{k+1} = 2 \cdot 2^k > 2 \cdot k^2$. We need to show $2 \cdot k^2 > (k+1)^2$. $2k^2 > k^2 + 2k + 1 \iff k^2 > 2k + 1$. For $k \geq 5$, $k^2 > 2k + 1$ is true. Therefore, $P(k+1)$ is true. By induction, $P(n)$ is true for all $n \geq 5$.

Let $P(n)$ be the statement that $3^n > n^3$. We will prove that $P(n)$ is true for all $n \geq 10$ by mathematical induction.

Base Case: $n = 10$. $3^{10} = 59049 > 1000 = 10^3$. True.

Inductive Step: Assume $P(k)$ is true for some $k \geq 10$. We need to show $P(k+1)$ is true. $3^{k+1} = 3 \cdot 3^k > 3 \cdot k^3$. We need to show $3 \cdot k^3 > (k+1)^3$. $3k^3 > k^3 + 3k^2 + 3k + 1 \iff 2k^3 > 3k^2 + 3k + 1$. For $k \geq 10$, $2k^3 > 3k^2 + 3k + 1$ is true. Therefore, $P(k+1)$ is true. By induction, $P(n)$ is true for all $n \geq 10$.

Let $P(n)$ be the statement that $4^n > n^4$. We will prove that $P(n)$ is true for all $n \geq 13$ by mathematical induction.

Base Case: $n = 13$. $4^{13} = 67108864 > 28561 = 13^4$. True.

Inductive Step: Assume $P(k)$ is true for some $k \geq 13$. We need to show $P(k+1)$ is true. $4^{k+1} = 4 \cdot 4^k > 4 \cdot k^4$. We need to show $4 \cdot k^4 > (k+1)^4$. $4k^4 > k^4 + 4k^3 + 6k^2 + 4k + 1 \iff 3k^4 > 4k^3 + 6k^2 + 4k + 1$. For $k \geq 13$, $3k^4 > 4k^3 + 6k^2 + 4k + 1$ is true. Therefore, $P(k+1)$ is true. By induction, $P(n)$ is true for all $n \geq 13$.

Let $P(n)$ be the statement that $5^n > n^5$. We will prove that $P(n)$ is true for all $n \geq 17$ by mathematical induction.

Base Case: $n = 17$. $5^{17} = 762939453125 > 1419859 = 17^5$. True.

Inductive Step: Assume $P(k)$ is true for some $k \geq 17$. We need to show $P(k+1)$ is true. $5^{k+1} = 5 \cdot 5^k > 5 \cdot k^5$. We need to show $5 \cdot k^5 > (k+1)^5$. $5k^5 > k^5 + 5k^4 + 10k^3 + 10k^2 + 5k + 1 \iff 4k^5 > 5k^4 + 10k^3 + 10k^2 + 5k + 1$. For $k \geq 17$, $4k^5 > 5k^4 + 10k^3 + 10k^2 + 5k + 1$ is true. Therefore, $P(k+1)$ is true. By induction, $P(n)$ is true for all $n \geq 17$.