

NEW MEXICO STATE LAND OFFICE
SANTA FE, NEW MEXICO

DEPARTMENT OF THE STATE GEOLOGIST
NOTICE OF INTENTION TO TEST WATER SHUT-OFF

Notice must be given to the State Geologist or to the proper Oil and Gas Inspector at least five days before the test. It is desirable that a representative of the Department of the State Geologist witness the water shut-off before drilling into the productive sand whenever possible. If changes in the proposed plan are considered advisable, a copy of this notice showing such changes will be returned to sender. Submit this notice in triplicate.

Hobbs

3-13-35

N. Mex., 19

Mr. E.H. Wells

State Geologist,
Santa Fe, New Mexico.

Dear Sir:

You are hereby notified that we intend to test the shut-off of water in State C-20

Well No. 3 in NW of Sec. 20, T. 21S, R. 36E

N. M. P. M., Kunice Oil Field Lea County,

on 3-15 19 35 7-5/8" in. 26.40# lb. casing was { cemented } in Anhydrite

formation at a depth of 1628 feet on March 12th 19 35

400 sacks of Eltore cement were used.

The method used in placing the cement was as follows: Halliburton method.

Fluid level will be bailed to a depth of _____ feet and left undisturbed for at least 12 hours before your inspection.

Adjacent property owners have been notified as follows: _____

Shell Petroleum Corp., Hobbs N.M.

Additional information:

Pipe will be tested with 600# pressure for 30 Mins before drilling plug and with 600# pressure for 30 minutes after drilling plug.

MAR 15 1935

Approved _____ 19

Except as follows:

Sincerely yours,

Continental Oil Co.

Company or Operator.

By H.B. HurleyPosition District Supt.

Send communication regarding well to

Name H.B. HurleyAddress P.O. Box CC Hobbs N.M.

J. J. Vesely
State Geologist or Oil and Gas Inspector.

3CR

PHYSICS 354: QUANTUM MECHANICS

PROBLEM SET 1: THE SCHRÖDINGER EQUATION

The purpose of this problem set is to introduce the Schrödinger equation and its solutions. We will consider the free particle, the particle in a box, and the harmonic oscillator. The problems are designed to be solved using the methods of separation of variables and the power series method.

1. Consider a free particle of mass m moving in one dimension. The wave function $\psi(x)$ satisfies the Schrödinger equation

$$-\frac{\hbar^2}{2m} \frac{d^2 \psi}{dx^2} = E \psi$$

where E is the energy. The wave function must be normalized, i.e.,

$$\int_{-\infty}^{\infty} |\psi(x)|^2 dx = 1$$

2. Consider a particle of mass m in a one-dimensional box of length L . The wave function $\psi(x)$ satisfies the Schrödinger equation

$$-\frac{\hbar^2}{2m} \frac{d^2 \psi}{dx^2} = E \psi$$

with boundary conditions $\psi(0) = \psi(L) = 0$. The energy levels are given by

$$E_n = \frac{n^2 \pi^2 \hbar^2}{2mL^2}$$

$$\psi_n(x) = \sqrt{\frac{2}{L}} \sin\left(\frac{n\pi x}{L}\right)$$

3. Consider a harmonic oscillator of mass m and spring constant k . The wave function $\psi(x)$ satisfies the Schrödinger equation

$$-\frac{\hbar^2}{2m} \frac{d^2 \psi}{dx^2} + \frac{1}{2} kx^2 \psi = E \psi$$

The energy levels are given by

$$E_n = \left(n + \frac{1}{2}\right) \hbar \omega$$

$$\omega = \sqrt{\frac{k}{m}}$$

$$\psi_n(x) = \frac{1}{\sqrt{2^n n!}} \left(\frac{m\omega}{\pi\hbar}\right)^{1/4} e^{-\frac{m\omega x^2}{2\hbar}} H_n\left(\sqrt{\frac{m\omega}{\hbar}} x\right)$$

$$H_0(x) = 1, H_1(x) = 2x, H_2(x) = 4x^2 - 2$$