62E) a) \( \Delta U = mgh = (5.5 \times 10^6 \text{kg})(9.8 \text{m/s}^2)(50 \text{m}) = 2.7 \times 10^9 \text{ J} \), per second, or Watts.

b) Energy per hour \( = \frac{2.7 \times 10^9 \text{ J}}{\text{hr}} \times \frac{3600 \text{ sec}}{\text{hr}} = 9.72 \times 10^9 \text{ J} \).

c) The rate would be \( 2.7 \times 10^9 \text{ J/sec} \) or \( 2.7 \times 10^6 \text{ kW} \).

c) The energy generated per year would be \( (2.7 \times 10^6 \text{ kW})(24 \text{ hr} \times 365) = 2.36 \times 10^{10} \text{ kwh} \).

The cost at $0.01 per kwh would be \( $0.01 /\text{kwh} \times 2.36 \times 10^{10} \text{kwh} = $2.36 \times 10^8 \)

or 2.36 million dollars.

64E) The volume \( V \) of the water that flows to the ocean is

\[
V = (8 \times 10^6 \times 10^6 \text{ m}^2 ) \left( \frac{1}{3} \times 0.75 \text{m} \right) = 2 \times 10^7 \text{ m}^3
\]

The mass \( m \) of water returning to ocean is

\[
m = \frac{2 \times 10^7 \text{ m}^3 \times 1000 \text{ kg}}{1 \text{ m}^3} = 2 \times 10^{11} \text{ kg}
\]

This water falls an average of \( h = 500 \text{ m} \).

i. Change of potential energy is

\[
\Delta U = mgh = (2 \times 10^{11} \text{ kg})(9.8 \text{ m/s}^2)(500 \text{ m}) = 9.8 \times 10^{16} \text{ J}
\]