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Los Alamos

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memorandum

TO: ESH-18 Reading File

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SYMBOL: ESH-18/WQ&H-95-409

SUBJECT: **GROUNDWATER VELOCITIES IN LOS ALAMOS CANYON**

This memorandum is to document current best estimates of the probable rates of shallow groundwater movement in Los Alamos Canyon. These estimates are based upon preliminary and unpublished single-well piezometer recovery tests (slug tests) performed by ESH-18 hydrologists. The shallow groundwater is found within the canyon bottom alluvium and, to a minor degree, also within the underlying weathered tuff.

Shallow groundwater flow down the canyon is expected to be quite rapid, given the coarse texture of the alluvial materials in the canyon. Hydraulic conductivity values obtained from recent slug tests in the canyon are typical of those for a clean sand.

Well	Hydraulic Conductivity (ft/sec)
LAO-C	3.8 E -05
LAO-1	5.2 E -04
LAO-2	3.3 E -04
LAO-3	4.8 E -04
LAO-3A	4.0 E -04
LAO-4	7.9 E -04
LAO-4.5A	7.65 E -05
LAO-4.5C	9.1 E -05
LAO-5	1.1 E -04
Mean	3.2 E -04

The average rate of groundwater movement in the alluvium is estimated to be in the order of approximately 900 ft per year, as calculated using a modification of Darcy's Law:

$$\text{Velocity} = \frac{(\text{Hydraulic Conductivity}) * (\text{Gradient})}{\text{Effective Porosity}}$$

with H.C. = 3.2E-4 ft/sec (mean of slug test results)
Grad. = 0.027 ft/ft (slope of stream channel)
Porosity = 0.3 (assumed value)

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