

## **DETERMINATION CRITERIA**

### **GROUNDWATER UNDER DIRECT INFLUENCE OF A SURFACE WATER**

REF: *Kauai County Department of Water Supply GWUDI Compliance Study*, USEPA & Manchester Environmental Laboratory, November 1999

1. Samples test positive for Total Coliforms or Fecal Coliforms for last 3 years
  - a. >10% of samples exceed 100 TC/100 ml **or**
  - b. >10% of samples exceed 20 FC/100 ml
2. Historical data on microbial analyses or actual outbreaks
3. Turbidities
  - a. Turbidity exceeds 1.0 NTU
  - b. Seasonal (yearly) fluctuations >0.5 NTU is indicative of surface water influence
4. Microscopic Particulate Analysis (MPA) “relative risk” score of  $\leq 9$  is considered at “low risk” of being a GWUDI.
5. Hydraulic connection: openings allowing entry by surface waters (runoff, rainfall, mixing with other connected surface water or GWUDI sources)
6. Openings allowing entry by birds, small mammals and insects
7. Root ball intrusion through tunnel walls
8. Fish, amphibians or insects present in water source
9. Bioindicators present (in order of decreasing risk weighting): *Giardia*; coccidia and other parasitic ova; diatoms; other chlorophyll-containing algae; insects and their larvae; rotifers and plant debris. Green algae require sunlight. Rotifers eat bioindicators.
10. Rapid water quality changes (turbidity, temperature, conductivity and pH) following heavy rainfall and runoff events. Temperature fluctuations >20% over the course of a year may indicate a GWUDI.

#### MITIGATIVE MEASURES (recommend re-testing after completed)

1. Repair source entrances, connections or structures to eliminate entry by surface waters, wildlife or insects
2. Periodic inspection and maintenance