**Liquid Waste Collection**

Environmental Health and Safety provides polyethylene jugs for the collection of liquid radioactive waste. A liquid radioactive waste tag is attached to these containers. The back of this tag provides information for the proper use of the waste container and basic instructions for completing the tag. The front of this tag includes a form that the user must complete in order for the waste to be collected. This card must be completed properly in order for the waste to be collected. Below are additional rules concerning the proper handling of liquid waste:

* 1. LIQUID WASTE CONTAINERS MUST BE CAPPED AT ALL TIMES WHEN NOT IN USE.
  2. Liquid waste containing radioiodine must be stored in special containers provided by Environmental Health and Safety that contain chemicals to inhibit the formation of iodine vapors.
  3. Liquid waste containing milk, blood, homogenized tissue, etc. should be kept frozen or treated with chemicals to inhibit decomposition until it is collected.
  4. Liquid radioactive waste should be segregated by using separate containers for aqueous waste, organic materials, and liquid scintillation fluid from flow through liquid scintillation counters.
  5. Do not place different isotopes in a single waste container without the prior approval of EHS.

The activity of the waste in a liquid waste jug may be determined by following the instructions:

[Click here for instructions to estimate the activity of I-125 in a full EHS issued liquid waste jug.](http://ehs.psu.edu/sites/ehs/files/how_to_estimate_i-125_in_liquid_waste.doc)

[Click here for instructions to estimate the activity of P-32 in a full EHS issued liquid waste jug.](https://ehs.auth.abs.vmhost.psu.edu/sites/ehs/files/how_to_estimate_p-32_in_liquid_waste.doc)

For radionuclides other than P-32 and I-125, or partially full containers the best way to determine the amount of radioactive material in liquid waste is to count a 1 milliliter sample in a liquid scintillation or gamma counter when the jug is ready to be collected for disposal. Follow these steps:

1. Count the sample for 1 to 10 minutes.
2. Obtain the disintegration rate (dpm) of the sample by dividing the obtained count rate (cpm) by the instrument counting efficiency for that radionuclide.
3. Correct this result for the total volume of the container, by multiplying the result by the volume of the container divided by the volume of the sample. A full container holds approximately 9,500 milliliters. So, for a jug filled to the fill line, and a 1 millilter sample, multiply the result by 9,500.
4. Convert the disintegration rate to mCi units, where 1 mCi = 2.22 x 109 dpm.

For example, if a sample of tritium waste counted in an LSC with an efficiency of 50% had 10,000 net cpm, there would be 20,000 dpm of tritium in the sample.

**sample dpm = 10000cpm / 0.50 = 20000 dpm**

The jug would then have a total of 1.9 x 108 dpm of tritium.

**jug dpm = sample dpm x (jug mL / sample mL)  
jug dpm = 20000 dpm x (9500 mL / 1 mL)  
jug dpm = 1.9 x 108 dpm**

Converting to milliCuries, we have a total of 0.086 mCi of tritium in the jug.

**jug mCi = (jug dpm) / (2.22 x 109 dpm / mCi)  
jug mCi = 0.086 mCi**