CLAIMS:

1. A system comprising:

a shielding assembly that has a plurality of compartments each formed of a shielding material providing a barrier to radioactive radiation, comprising:

a first compartment configured to receive a radioisotope generator that generates a radioactive eluate via elution;

a second compartment configured to receive a beta detector, and

a third compartment configured to receive a gamma detector.

2. The system of claim 1, wherein the third compartment is configured to receive an eluate-receiving container such that both the gamma detector and the eluate-receiving container can be positioned in the third compartment.

3. The system of claim 2, wherein the third compartment comprises a sidewall defining an opening through which the eluate-receiving container can be inserted.

4. The system of claim 3, wherein the gamma detector is positioned to detect gamma emissions emitted by a static portion of the radioactive eluate received by the eluate-receiving container.

5. The system of claim 3, further comprising a removable insert positioned in the opening, wherein the removable insert defines a cavity configured to receive the eluate-receiving container.

6. The system of claim 5, wherein the sidewall has an inwardly extending support means, the removable insert comprises a body with a closed bottom wall, and a portion of the closed bottom wall of the removable insert is positioned on the inwardly extending support means of the sidewall.

7. The system of claim 6, wherein the inwardly extending support means is selected from the group consisting of a shoulder, a ridge, and an inwardly protruding element.

8. The system of claim 6, wherein the removable insert further comprises a collar extending outwardly from the body and resting on a rim defining the opening of the third compartment.

9. The system of claim 1, wherein the first compartment, the second compartment, and the third compartment are positioned in different planes both vertically and horizontally from each other.

10. The system of claim 9, wherein the third compartment is positioned at a higher elevation than the first compartment, and the second compartment is positioned between the first compartment and the second compartment.

11. The system of claim 1, wherein the first compartment defines an opening and the third compartment defines an opening, and the opening of the third compartment is offset both vertically and horizontally from the opening of the first compartment.

12. The system of claim 1, wherein a radiation path is defined from the radioisotope generator when installed in the first compartment to the gamma detector when installed in the third compartment, and wherein the radiation path has an angle ranging from 30 degrees to 75 degrees with respect to ground.

13. The system of claim 1, wherein a radiation path is defined from the radioisotope generator when installed in the first compartment to the gamma detector when installed in the third compartment, and wherein the radiation path passes through a portion of the second compartment.

14. The system of claim 13, wherein the portion of the second compartment through which the radiation path passes includes at least 10 centimeters of the shielding material.

15. The system of claim 13, wherein the portion of the second compartment through which the radiation path passes includes less than 4 centimeters devoid of the shielding material.

16. The system of claim 13, wherein the second compartment is positioned so that the radiation path within the shielding material of the second compartment is maximized.

17. The system of claim 16, wherein the radiation path within the shielding material is maximized by configuring the radiation path to pass through a greater length of shielding material than void space of the second compartment.

18. The system of claim 13, wherein the radiation path passes through a portion of the third compartment.

19. The system of claim 1, wherein:

the shielding assembly further comprises a fourth compartment configured to receive a waste container,

a radiation path is defined from the radioisotope generator when installed in the first compartment to the gamma detector when installed in the third compartment,

the radiation path passes through a portion of the third compartment and a portion of the fourth compartment, and

the portion of the third compartment and the portion of the fourth compartment through which the radiation path passes includes, in combination, at least 15 centimeters of the shielding material.

20. The system of claim 19, wherein the third compartment is positioned so that the radiation path within the shielding material of the third compartment is maximized.

21. The system of claim 1, wherein a radiation path is defined from the radioisotope generator when installed in the first compartment to the gamma detector when installed in the third compartment, and wherein the shielding assembly has at least 30 centimeters of the shielding material positioned along the radiation path.