

Instructions for analyzing soil using the portable X-Ray Fluorescence (XRF)

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*****Important:** Make sure to take the proper **radiation safety course** prior to use.

Preparing Samples:

1. Load ~1 g dry, fine-grained soil into plastic sample holder. It must be enough to blanket the surface area of the holder cylinder top.
2. Tear off a section of uncreased mylar film. Place over open top of sample holder cylinder.
3. Slide a thin plastic ring over mylar film onto holder. Avoid fingerprinting or creasing film.
4. When film is taut over holder top, slide thicker ring over until it snaps in place. Film surface should be flat and perfect.
5. Turn holder upside-down and assure that sample covers the entire film surface.

Setting up the XRF unit:

1. Remove unit from case. Unscrew battery pack panel on rear, remove panel, plug battery into the unit. (Battery remains disconnected during disuse because it will drain in absence of external power source). Turn handle until it clicks and rest unit on it, tilted upward from the table, with screen facing toward the user.
2. Remove X-ray base, X-ray unit, cord, protective lid, and power source from case. Place base on firm surface and attach X-ray unit to it; X-ray unit stands upright with rubber handle/cord slot on the bottom. Tighten screws to hold firm. Safety lid attaches with elastic band around bottom of X-ray unit. Metal disc lies between safety lid plate and X-ray unit.
3. Connect power source and connect main unit with X-ray unit. Connector cable has protective covers over ends; remove and set aside. Turn unit on.

Operating the XRF unit:

1. Correct time and date every time the unit is used.
2. From the main menu, choose (2) “**choose an application**”. Then scroll down to “**fine particle soil app**”. Choose “**OK**”, then “**YES**”.
3. Load sample. *****Do not open safety lid if X-ray unit is blinking red or unit says “source is on”.***** Otherwise, open safety lid, place sample film-side-down (making sure that soil covers entire film) in the circular spot designated for it.
4. Choose “**continue**”. Unit will now read “source is on”, and red light will blink from beneath X-ray unit. Do not open lid until run is complete (approximately 5 minutes).
5. Enter name for sample.
6. The results will now be shown in ppm. Select [**OPTS**], then (3) **Show std dev**. (A general rule of thumb: if ppm is greater than 3X the standard deviation, it is credible data).
7. Copy down results. (Alternatively, a linkup with a PC is possible.)
8. Choose “**continue**” to run again, or replace sample prior to running again. Multiple runs are recommended.