

## Frequently asked questions about NAPL FLUTes

(available on our web site [www.flut.com](http://www.flut.com) with links active)

These answers are necessarily brief. For more information call us at 505-852-0128.

1. *Does the NAPL FLUTE respond to \_\_\_?\_\_\_?* Perhaps. See the list of compounds tested by FLUTE or our customers at [NAPL FLUTE reactive compounds](#).
2. *How are NAPL FLUTes installed?* For subsurface in situ measurements, NAPL FLUTes are installed in stable open boreholes on blank liners or through driven casing such as direct-push rods.
3. *Can the NAPL FLUTE system be used to assess core?* Yes. A folded strip of the reactive cover material can be inserted in a split core, but evaporation of some NAPLs should be avoided. Ask for the recommended procedure. Sonic core can be extruded into a tubular cover of the reactive cover material. See [sonic core assessment](#) for that procedure.
4. *Is special equipment needed for the subsurface installations?* Yes, for the use in direct push rods, an injection pump is needed. A wellhead roller and winch is needed for the installation and removal from open stable holes. Direct push liners are usually easily pulled from the hole by hand (the liner should be filled to the top when that is done).
5. *How long should the reactive material be left in place?* For subsurface installations, at least 10 minutes, but an hour is recommended. A video is available showing the reaction of the reactive material to TCE and to gasoline.
6. *Can one determine free product thickness with the NAPL FLUTE?* No. Because the hydrophobic cover material aggressively wicks the NAPL/DNAPL, it will exaggerate the thickness. The size of a stain is a better measure of the quantity available rather than the thickness of free product.
7. *How soon can a NAPL FLUTE be shipped?* Usually within a week of the order. However, it depends on the schedule of other FLUTE fabrications. An early order is better.
8. *Can NAPL FLUTE systems be installed by anyone?* Yes. But, there is some training required. Explicit instruction in the procedure is available. If desired, a FLUTE field person can provide on-site training and assistance with the first installations.
9. *What is the price for the NAPL FLUTE liner?* See the [NAPL FLUTE price sheet](#).
10. *Can the reactive cover material be purchased without a liner?* Yes. The reactive cover material is sometimes used to assess core or is lowered into a well to detect the presence of a thin layer of DNAPL at the bottom of the well.
11. *Can the NAPL FLUTE be installed through sonic casing?* Yes, the procedure is similar to the installation through direct push rods. However, it is best done by FLUTE.
12. *Is the NAPL FLUTE installation a reliable method?* A false positive (i.e., an obvious stain with no NAPL present) is very unlikely. No stain only means that the cover did not contact NAPL. It does not mean that the NAPL is not nearby.

13. *Does the NAPL FLUTE system detect the dissolved phase?* No. It does not react to the dissolved phase, but only to contact with the pure product. The FACT system added to the NAPL cover will measure the dissolved phase.
14. *Can the NAPL carrier liner be reused for installation into an open borehole?* Yes. It is common practice to reinstall the blank carrier liner alone to seal the borehole after the reactive cover has been removed. It is also common practice to perform a transmissivity profile of the borehole with the carrier liner reinstallation.
15. *Can the carrier liner be reused with a new NAPL cover?* No. It is very difficult to replace a cover on a carrier liner in the field without the special FLUTE equipment. It is also a concern that NAPL on an old liner might cause a stain on a new cover.
16. *Can a NAPL FLUTE be reused if there is not staining?* Generally, no. In order to examine the cover, it must be removed from the liner.
17. *Must the NAPL FLUTE be the same length as the open borehole?* A NAPL FLUTE is usually installed to the bottom of the hole to assess the presence of DNAPL in the bottom of the hole. Therefore, the liner must be at least as long as the hole depth. It is not unusual to install a NAPL FLUTE which is longer than the actual hole depth.
18. *Can a NAPL FLUTE shorter than the direct push rods be installed?* No. The liner must be at least as long as the rods plus ~5 ft. The liner must protrude from the bottom of the rod after the first rod section is removed. A shorter liner may also allow sand to flow into the bottom of the rod and prevent the liner descent relative to the rod.
19. *Is an expendable tip needed in the push rod?* Yes. A tip slightly larger than the rod diameter is needed. It will be left in place when the first rod section is raised for removal. The tip should not be pounded out of the end of the rod before the liner is emplaced in the rod and the tip must be lubricated to easily remain in place at the bottom of the hole.
20. *What direct push rod sizes can be used with NAPL FLUTES?* An id of 1.5 to 2.5" is readily compatible with hole sizes of 2.25 to 3.5". Smaller id systems have been built, but are a special order now.
21. *Is the water rising out of the liner in direct push rod holes during its removal contaminated?* Not if potable water was used for the installation. Hence there is not usually a need to dispose of IDW with the NAPL FLUTE system in direct push holes. However, the well water that may be produced from the well via a pump tube to the bottom of the well during the installation of a NAPL FLUTE into an open stable hole is considered contaminated.
22. *Can I use NAPL FLUTES in auger holes?* Only if they are open and stable after the auger is removed. There is a concern about the smearing of NAPLs by the augering process.
23. *Should a borehole be developed before installing a NAPL FLUTE?* Surfing to remove cuttings from the fractures is reasonable, but very heavy pumping may remove the NAPLs from their normal locations and produce no stains on the NAPL FLUTE. Core-holes have often been successfully assessed with NAPL FLUTE (i.e., staining was observed in fractures flowing DNAPL). It is recommended that one borehole water

volume be removed as the liner descends to allow the NAPL FLUTE to seal inflowing fractures. However, that is not essential to detect fractures filled with DNAPL.

24. *Can one determine the compound by the NAPL FLUTE stain?* No. However, there are obvious differences in the nature of the stain between NAPLs with varying degrees of solvent capability (e.g., TCE, versus gasoline, versus oil). The color of the NAPL usually also contributes to the color of the stain. The geometry of the stain sometimes is important to the interpretation.
25. *What is the FACT?* FACT stands for “FLUTE activated carbon technique” The FACT uses a strip of activated carbon felt attached to the inside surface of the NAPL FLUTE cover. A diffusion barrier isolates the felt strip from the liner. The liner presses the carbon felt strip against the hole wall which allows the activated carbon to absorb contaminants from the pore fluid of the hole water material. The result is a replica of the contaminant distribution dissolved in the pore liquid and the fractures as it is absorbed in the carbon felt. The carbon strip is withdrawn with the NAPL cover and is sectioned and analyzed with a mass spectrometer for contaminant concentration in the carbon. The FACT is often used in combination with a FLUTE transmissivity profile to identify the intervals of carbon strip to be analyzed.