



EnviroMail # 68

July 2013

Sampling and Analysis Implications of the new NEPM

INTRODUCTION

While the draft NEPM has been available since 2010, the promulgation of the final document occurred in May 2013. There are many changes which impact industry professionals. From a laboratory perspective there are two main areas –

1. Testing requirements
2. Sampling and analysis

This EnviroMail covers several key sampling and analysis changes that relate to laboratories that impact the choice of analytes and data quality objectives.

KEY CHANGES COVERED IN THIS ENVIROMAIL:

- TRH/TPH and Silica Gel
- Holding Times
- Low Flow Sampling/Field Techniques
- Secondary Split Submission

ITEMS COVERED IN ENVIROMAIL 69:

- TRH/BTEXN plus F1-F4
- NEPM Metals Suite Changes
- HSL Soil Classification, ABC's and ACL's
- Cyanide Changes
- PAHS B(a)P TEQ

HOLDING TIMES & TRANSITION PERIOD:

Regulators have indicated a 12 month transition period will apply for the NEPM to allow companies to finalise and submit work, which is consistent with the original NEPM and already substantially progressed. The 12 month transition period will allow laboratories time to modify relevant procedural arrangements.

ALS Holding times & Interpretive DQO Reports

ALS will complete a holding time review and adopt new holding times by 1st August 2013.

NEPM TRH vs. TPH and Silica Gel clean-up

The May 2013 NEPM has resulted in a number of changes around TPH/TRH reporting (refer to EnviroMail 51). In addition, there is further guidance on Silica Gel clean-up (B1 2.4.5). This applies in particular to the non-volatile component of TRH (i.e. >C10+). TRH is now more correctly termed as Total Recoverable Hydrocarbons (equivalent to the 'old TPH'). TRH is a measure of extractable petroleum, biological and non-petroleum hydrocarbons e.g. Phthalates, Pesticides, Natural Oils and even compounds such as PBDEs, PCBs and AFFFs.

The TRH analysis by GC-FID is non-specific and the solvents will extract a wide range of chemicals including organic acids and even oils from leaves. As such, when using TRH as a screen for petroleum hydrocarbon it is likely to be conservative and may risk presenting false positives where non petroleum compounds are present. Examples seen over the years include:

- Peat lenses (can be found near Botany in Sydney)
- Ashfield Shale (Can also include PAHs/dioxins)
- Grease Trap waste or Bio-solids
- Gum leaves or Sap.
- Compost
- Highly fertile dark soil (e.g. in NZ)

The Use of TRH for Screening

TRH is often used as a screen as well as for a conservative estimate of Petroleum hydrocarbon impact. Two common scenarios follow;

1. TRH is used on a service station site to measure potential hydrocarbon impact.
2. TRH is used on a general industrial site which may have hydrocarbons plus an array of other chemicals.

With potentially different objectives above, the results should be viewed in context of 'matrix' false positives. In these cases a silica gel clean-up may be used to remove long chain fatty acids etc. Alternatively, the specific chemicals of concern should be tested for.

HOLDING TIMES CHANGES AND IMPLICATIONS

There are a number of new NEPM holding times, most of which make sense or improve quality.

Moisture, Fluoride, Bromide, Chloride, Cyanide and Organics Carbon holding times have been extended and CEC has been reduced from six months to one month. Hexavalent Chromium is included and also has a post extraction holding time. These are all based upon retention of field moist splits.

Dioxins holding times have been reduced for field moist soils however ALS has a preparation procedure which allows this to be one year in accordance with USEPA procedures. Total Sulfur procedures at ALS also facilitate extended storage.

Analyte	New Holding Time	Sample Condition
Moisture Content	14 days	Field moist
Fluoride	28 days	Air dry or field moist
Cyanide	14 days	Field moist
CECs	28 days	Air dry or field moist
Mercury & Chromium VI	28 days – Cr(VI) 7 days post extraction	Field moist
Organic Carbon	28 days	Air dry or field moist
VOC's – except: -vinyl chloride etc*	14 days	Field moist
*-vinyl chloride, -styrene -2-chloroethyl vinyl ether	7 days	Field moist
Dioxins & Furans, PCBs	28 days	Field moist
Total Sulphur	7 days	Air dry or field moist

Changes for some VOC Holding Times

The most significant of the holding time changes is the shorter holding time for some VOC chemicals (Vinyl Chloride & Styrene). This is due to potentially more rapid losses in some conditions caused by a variety of reasons including chemical breakdown of double bonds or polymerisation.

As a result of this, from August 1st, ALS will move to the conservative approach of reporting VOCs in soil with a holding time of 7 days. What this means for practitioners is that the holding times on interpretive reports will indicate *potential breaches on a worst case scenario* and this should be assessed based upon the *key analytes of interest*. This also means that soils for VOCs need to be submitted in a very rapid manner, especially before weekends and breaks such as Easter holidays.

LOW FLOW SAMPLING / FIELD TECHNIQUES FOR METALS

NEPM B2 section 8.2.4 provides guidance on groundwater sampling. Key points to note here are the emphasis on low flow sampling with 'purging and sampling methods using bailers or high speed pumps not recommended'. Where an improved technique becomes available the NEPM recommends it be trialled in combination with existing methodologies to assess whether the change in results is due to sampling methods. ALS has considerable experience in assisting such trials to compare different sampling techniques.

The other important change in the NEPM (B2 section 8.2.4.4) is the recommendation not to field filter metals in the laboratory unless it has been demonstrated that the analytical results are consistent regardless of whether filtration is carried out in the field or laboratory.

SECONDARY LABORATORIES AND DISPATCH OF SECONDARY DUPLICATES/SPLIT SAMPLES

Both the 1999 and 2013 NEPM B3 modules provided guidance on the use of secondary laboratories. There are a few subtle changes however in the newest version.

The first change is that best practice now suggests samples be rapidly split and sent to secondary lab independently to minimise transit and analysis times. Guidance is also for field and secondary duplicate samples to be created **as fast as possible** by halving the sample into smaller containers, compacting and then topping up to zero headspace. This is beneficial in reducing potential losses of VOCs (refer to B1 3.5.3).

In addition the definition of a secondary lab is different and recognises independent NATA accreditation (for ISO17025) by NATA. This may allow acquired businesses operating under different accreditation to act as secondary laboratories e.g. ALS WRG in Scoresby (Melbourne) providing secondary testing for traditional ALS laboratories in Springvale (Melbourne) and across Australia.

REFERENCES

NEPM B1 Guideline on Investigation levels for Soil and Groundwater – May 2013 (F2013L00768)

NEPM B2 Guideline on Site Characterisation – May 2013, (F2013L00768)

NEPM B3 Guideline on Laboratory Analysis of Potentially Contaminated Soils – May 2013, (F2013L00768)