

**Electronic Transfer of
Geotechnical
and
Geoenvironmental Data
AGS4
(Edition 4.0)**

Guidance Document

Guide to handling chemical data

ACKNOWLEDGEMENTS

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Comment and feedback from the wider geotechnical industry has also been fundamental to the ongoing evolution of the AGS Format, ensuring that the needs of the geotechnical and geoenvironmental industry and its clients continue to be met.

DOCUMENT HISTORY

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1 Scope

In AGS 4 the storage of contamination data has been split into two tables; GCHM for geotechnical chemical testing and ERES for environmental chemical testing. This guidance note covers the use of these two tables.

2 Definitions

Matrix – The phase of material tested e.g. liquid, solid or gas. The phase of the tested material may be different from the phase of the material passed to the laboratory if leaching or other preparation methods are used.

Reportable result – A result that has been included in the official report from the laboratory. There may be other results available that have not been officially reported and these can be transferred in AGS format even though they are not included in the report.

Detect flag – a parameter used to describe whether the concentration of the analyte is large enough to be determined by the laboratory equipment.

Organic - A compound that is any member of a large class of gaseous, liquid, or solid chemical compounds whose molecules contain carbon.

Laboratory qualifier – A character assigned by a laboratory to categorise non numeric results. This is commonly used as a "<" to show a result as less than method detection limit.

Interpreted qualifier – An agreed parameter assigned by a laboratory or consultant to categorise failure of test other than that described by the Laboratory qualifier.

Method detection limit - the minimum value that can be detected by the instrument, regardless of confidence or regulated/certified limits. See http://en.wikipedia.org/wiki/Detection_limit#Method_detection_limit for more information.

Reporting detection limit - the Method Detection Limit specified by the lab on the accompanying final lab reports. See http://en.wikipedia.org/wiki/Detection_limit#Method_detection_limit for more information.

Quantification limit - the Detection Limit as certified (e.g. MCerts) for the instrument and takes any dilution factors into account. See http://en.wikipedia.org/wiki/Detection_limit#Method_detection_limit for more information.

Total – A result from an unfiltered sample

Dissolved - A result from a filtered sample

Basis – Description of whether water vapour is present during the analysis. Wet basis includes water vapour and dry basis does not.

CAS Registry Numbers - are unique numerical identifiers assigned by the "Chemical Abstracts Service". See <http://www.cas.org/> for more information.

3 Background

In AGS 3.1 the determinand being tested is defined using a code field (CNMT_TYPE) and a test type field (CNMT_TTYP). CNMT_TTYP was used to differentiate between types of testing, e.g. whether the arsenic value was for total arsenic or available arsenic.

The CNMT_TTYP code has also been used in AGS 3.1 to part describe the sample preparation method and contained variations for different leaching and abstraction methods. The combination of testing type and preparation methods have generated a large number of TTYP codes and it is common to see even more non standard combinations and codes for CNMT_TTYP, most of which are inappropriate if paired up with a number of compounds in the CNMT_TYPE list. In AGS 4 the properties that were being combined into CNMT_TTYP codes have been separated and given their own fields.

The laboratories often found that AGS 3.1 did not include enough fields to transfer QA/QC data that they were being asked to produce for sites under regulation and so the ERES table has been expanded to include these fields. However geotechnical chemical testing, often carried out within a geotechnical laboratory does not require this level of detail and has therefore been moved to its own table to avoid confusion over which fields are required for geotechnical chemical testing.

4 Guidance

4.1 Geotechnical Chemical Testing

XXX – to be completed by others or removed from this NFG

4.2 Environmental Chemical Testing

4.2.1 ERES_CODE

ERES_CODE is used to describe the compound being tested. In AGS 4 the type of test (available, total) has been combined within the compound code into ERES_CODE so compounds that have multiple types of test therefore have multiple ERES_CODEs, (e.g. one for Arsenic Total and one for Arsenic Available). If a code's description does not state the type of test then Total is to be assumed. Below are the two codes for Arsenic Total and Arsenic Available as they appear on the AGS website.

| | |
|-----------|--------------------|
| 7440-38-2 | Arsenic |
| P1055 | Arsenic, available |

The AGS have upgraded their methods for requesting new codes and this are covered in full in the ABBR nfg (XXX) but summarised below.

1. Where the chemical has a CAS code assigned to it the CAS Code must be used as the ERES_CODE code.
2. Where a chemical does not have an assigned CAS code it is given a prefix "P" followed by a sequential number. (i.e.the 234th chemical added to the list will be called P234). This code is assigned automatically by the AGS website and therefore uniqueness of codes is guaranteed across providers.

4.2.2 Test Type

To avoid confusion the old TTYP code has been removed from the ERES group and replaced with the codes outlined below. These fields describe how the sample was prepared for testing.

1. ERES_LMTH is used to describe the method with which the sample has been leached.
2. ERES_MATX is used to describe the state of the tested material. This can either be "Solid", "Liquid" or "Gas" and may not be the same state as the initial sample – e.g. if a soil sample is leached to produce a liquid for testing then the matrix would be "Liquid".
3. ERES_BAS is the basis of the sample when tested. This should be "Wet" for wet-weight basis reporting, "Dry" for dry-weight basis reporting, or "NA" for tests which this distinction is not applicable.
4. ERES_TORD is whether the result has been derived from a total or dissolved test.
5. SPEC_PREP. This is a description field that is used to capture any preparation details not covered by the fields above.

Additional test type descriptive fields are ERES_DIL, ERES_PERP and ERES_ORG. If there is data applicable to these fields then it must be placed in these fields and not in the SPEC_PREP field.

4.2.3 Results

The AGS 3.1 result field CNMT_RESL has been kept in the ERES table as ERES_RTXT, but has been redefined as the reported result. This is a field that can contain the actual result or if the result is below or above the detection limit will contain the appropriate interpreted qualifiers (such as <) followed by the limit of reporting.

An additional field, ERES_RVAL, has been added to contain the actual result recorded on the analytical testing machines. Where no value is available for this field it should be left blank. When the value is below the detection limit the detection limit should be reported (WHERE IN RESL AND RVAL?) and the appropriate detection limit (WHICH FIELDS) and unit fields (WHICH FIELDS) should be completed.

The AGS 4 format gives the laboratories the option to report all results not just the ones that were reported to the client in the paper report. This additional data can be used by the data receiver to perform additional QA/QC checks if required. It is important to note that if a laboratory wishes to use this reporting option they must use different specimen references, set the analysis type field ERES_RTYP and flag whether the result was reported or not using the ERES_RRES Yes/No field.

4.2.4 Field testing

Field testing data transferred using ICCT in AGS 3.1 can be transferred in AGS 4 using the ERES group if a sample was created on site or should be transferred using the MOND group if the reading is being collected with an instrument directly in/from the source (river probe etc). If the result is sample based and transferred using ERES than the Lab location field ERES_LOCN should be set to "SITE" or "FIELDLAB"

4.2.5 Minimal dataset

The headings listed in the ERES group represent a range of attributes to describe chemical test results to cater for both simple and extended reporting requirements. It is important to note there is no requirement to complete all headings in data files for every analysis carried out. Only the key headings and the headings that are relevant to the testing and test result specification need be completed or used. Where additional QC data is required then further user defined headings may be necessary to transfer additional information. It is imperative that data providers and data receivers agree the specification for ERES data at the outset of a project.

It is recommended that the minimal dataset reporting requirements should contain the following fields.

LOCA_ID - Location Identifier
SAMP_TOP - Depth to top of sample
SAMP_REF -Sample reference
SAMP_TYPE -Sample type
SAMP_ID - Sample unique global identifier
SPEC_REF- Laboratory specimen reference or Laboratory ID
SPEC_DPTH -Depth of test specimen
ERES_CODE -Chemical code
ERES_METH - Test method
ERES_MATX - Laboratory test matrix
ERES_RUNI -Result unit
ERES_RTXT - Reported result
ERES_ORG - Organic
ERES_IQLF - Interpreted qualifiers
ERES_RDLM - Reporting detection limit
ERES_MDLM - Method detection limit
ERES_QLM - Quantification limit
ERES_DUNI - Unit of detection / quantification limits mg/l
SPEC_PREP - Details of specimen preparation including time between preparation and testing
SPEC_DESC - Specimen description
ERES_TORD - Total or dissolved
ERES_LOCN - Analysis location
ERES_BAS - Basis
ERES_DIL - Dilution factor
ERES_LMTH - Leachate preparation method
ERES_LDTM -Leachate preparation date and time
ERES_REM - Remarks
ERES_LAB - Name of testing laboratory/Organisation
ERES_CRED - Accrediting body and reference number (when appropriate)
TEST_STAT - Test status