Column Headings for ICARTT Format Data Files

Following are guidelines for consistent application of column headings (combined variable names and units) in ICARTT format data files.

Variable_Code is the column name or heading in an ICARTT format data file. It is the combination of
- a named measured chemical or physical constituent or a named attribute (metadata) that describes a measured constituent and
- an appended code that denotes the type of values reported in the column.

- **Accepted names** for chemical and physical constituents and descriptive attributes (metadata) are maintained by the MILAGRO data management team [**link**]. Contact the MILAGRO data management team for assistance in adding new names.

  These variable names have been constructed to be "friendly" to most data user software and data systems. Unique names should be limited to 18 characters. Exceptions were made for some chemicals (20 characters maximum) and other measurements and metadata to avoid overly cryptic names.

  There is a cross reference provided from the ICARTT (MILAGRO) accepted name to standard nomenclatures (as applicable) including CAS Registry Numbers, CAS Ninth Collective Index Nomenclature, EPA AQS Parameters and descriptions, and NARSTO standard names for (1) chemicals without CAS RNs and (2) physical and descriptive elements.

- **Codes** to be appended to accepted names have been defined.

Appended Code	Type of values reported in column	Code Information
"_units"	Individual measurement or attribute values with units as appended.	Accepted values for **units** of chemical and physical constituents and descriptive attributes (metadata) are maintained by the MILAGRO data management team [**link**].
_F	Quality flags for individual measurement or attribute values. ∗	Quality flags reported in the file must be defined in comments.
_UNC	Uncertainty for individual measurement values. ∗	A description of the uncertainty being reported must be provided in comments (e.g., confidence limit, method of calculation, etc.).
_DL, _LLOD, _ULOD	Detection limits for individual measurement values. ∗	A description of the detection limit being reported must be provided in comments

* Please note that there are accepted names (attribute column headings) for reporting quality flags, uncertainty, and detection limits for an entire sample (i.e., row of data).

- Accepted designations for **units** of chemical and physical constituents and descriptive attributes (metadata) are maintained by the MILAGRO data management team [**link**]. Contact the MILAGRO data management team for assistance in adding new unit designations.

  These units have been constructed to be "friendly" to most data user software and data systems. Units designations should be limited to 12 characters.

  There is a cross reference provided from the ICARTT (MILAGRO) accepted unit designations to the NARSTO standard units names.

- Allowable characters in *Variable_Code*:
    - _ (underscore)
    - 0123456789
    - ABCDEFGHIJKLMNOPQRSTUVWXYZ
    - abcdefghijklmnopqrstuvwxyz

- Allowable syntax for *Variable_Code*:
    - Accepted name must start with a non-numeric character. Underscore is allowed.
    - No spaces.
    - An underscore is used to separate the accepted name from the code
    - Multiple underscores are allowed, but no consecutive underscores.
    - Maximum length is 32 characters.
    - The preferred longest length is 30 characters, that is, 18 characters for the variable name and 12 characters for the units designation.

- *Variable_Code* examples:

Variable_Code	Type of value	Name cross reference to NARSTO DES and CAS 9CI	CAS RN	EPA AQS Parameter Code	Units cross reference to NARSTO DES
Precipitation_mm	Measured	Precipitation		65102	mm (millimeter)
Temp_air_deg_C	Measured	Temperature: air			deg C (degree Celsius)
Particles_mass_ug_m3	Measured	Particles: mass			ug/m3 (microgram per cubic meter)
Benzene_ppbv	Measured	Benzene	71-43-2	45201	ppbv (part per billion by volume)
Benzene_F	Flag	Benzene	71-43-2		None
Benzene_UNC	Uncertainty	Benzene	71-43-2		ppbv (part per billion by volume)
Benzene_DL	Detection Limit	Benzene	71-43-2		ppbv (part per billion by volume)
Pentene_2_4_4_trimethyl_ppbv	Measured	Pentene, 2,4,4-trimethyl-	25167-70-8		ppbv (part per billion by volume)
Alt_amsl_m	Measured	Altitude: above mean sea level			m (meter)
Lat_dd	Measured	Latitude: decimal degrees			decimal degree
Light_bcksctr_coef_1_Mm	Measured	Light backscattering coefficient			1/Mm (inverse megameter)